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MISSILE LAUNCHING COMPLEX

TYURA TAM, USSR

COMPARATIVE ANALYSIS OF [redacted] PHOTOGRAPHY

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PIC/JR-2/60

FEBRUARY 1960

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PREFACE

This joint photographic intelligence report has been prepared by the Army, Navy, and Central Intelligence Agency. It utilizes [redacted] photography to update the analysis of the Tyura Tam Missile Launching Complex made in CIA/HTA/JR-4/58, based on [redacted] photography. This report responds to Guided Missile and Astronautics Intelligence Committee (GMAIC) requirements and requirement X-12-59 established by the Joint Project Requirements Committee of the Photographic Intelligence Center, CIA. It confines itself generally to new developments and reinterpretation of previously known features. Textual repetition of both specific information and general description from HTA/JR-4/58 has been avoided except in instances where it facilitates discussion and presentation.

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The [redacted] photography does not cover either of the major down-range instrumentation facilities, nor is there any later coverage of the probable terminal-range facilities on Kamchatka Peninsula than the [redacted] photography utilized in HTA/JR-4/58. While the Range Head and the Support Base are again covered by good-quality photography, numerous questions remain unanswered on many aspects of the Complex, in particular with respect to details of the existing launching structure. The term "miles" used throughout this report means nautical miles and all orientations are referenced from True North.

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SUMMARY

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[redacted] photography shows the Tyura Tam Missile Launching Complex to be undergoing an expansion and improvement program, the outstanding feature of which is the construction of a new launch area. This new area, hereafter designated Launch Area "B", located about 10 miles east-northeast of the original launch area, is in the early stages of construction but already shows many similarities to Launch Area "A". Like Launch Area "A", it will be rail-served and have the characteristic "hook" in the approach line. As nearly as can be determined from the early stage of construction, the launching structure will be the same size as the existing structure. Other similar features will include a large pit for blast deflection and a control bunker located in the same relative position as at Area "A". Construction of Launch Area "B" does not appear to be proceeding on a "crash" basis.

Most facilities which were reported under construction in [redacted] were complete in [redacted] and improvements and new construction were continuing in several of the original areas of the Complex.

The only major reinterpretation involves the former possible Launch Area "B". This has been reidentified as a launch support facility for Launch Area "A", and has been included with other launch support facilities to make up a newly designated Launch Support Area "A".

The new photography re-emphasizes that the Tyura Tam Missile Launching Complex is a major permanent Soviet missile test center of unusual significance, and that rail transportation is relied on in almost every phase of operation within the Complex.

No new instrumentation or guidance facilities have been discovered which would indicate more than the two directions of fire from the Complex originally discussed in HTA/JR-4/58. One, the probable primary direction, is to the northeast (40°). The other, a possible alternate direction, is oriented to the east (90°).

A new Construction Support and Housing Area is located one mile east of Launch Area "B". The primary function of this area is to provide support for the construction of the new launch area. Permanent housing facilities are present. The area also contains associated construction components such as motor pools, storage and maintenance areas, open stores, a batch plant, railroad transloading points, and a construction material dump.

A new Construction Support Area is located about 9 miles southwest of Launch Area "B". This area is primarily served by a spur from the rail line leading to the new launch area. The materials furnished by this facility support road, rail, and rangehead construction projects.

In the original part of the Complex the most significant changes are as follows: A probable cascade facility has been constructed near the southwest corner of the launching platform. One of the rail spurs leading to the launching platform has been removed. A probable cable conduit and passageway, [redacted] feet in diameter, has been constructed from the control bunker to the launching structure. Further examination of the dark area positioned near the center of the launching platform indicates that it is circular, regularly-shaped, of uniform tone, and measures approximately 65 feet across. Although the nature of this dark area is unidentified, its uniformity and regularity indicate that it is not a missile blast or exhaust scar as was previously suggested.

The Instrumentation Control Center has been expanded in area to almost four times its original size. Five new buildings, a possible tracking antenna, and several unidentified objects have been added to the Center and are well dispersed.

In the Support Base important changes have been made. The Probable Propellant Production and Storage Area includes three new rail spurs, a new rail-served facility under construction, and three new water lines under construction. In the vicinity of Tyura Tam village, the main power plant facilities have been expanded, the water treatment facilities improved, the airfield runway hard-surfaced, and the handling facilities of the Storage and Construction Support Area increased.

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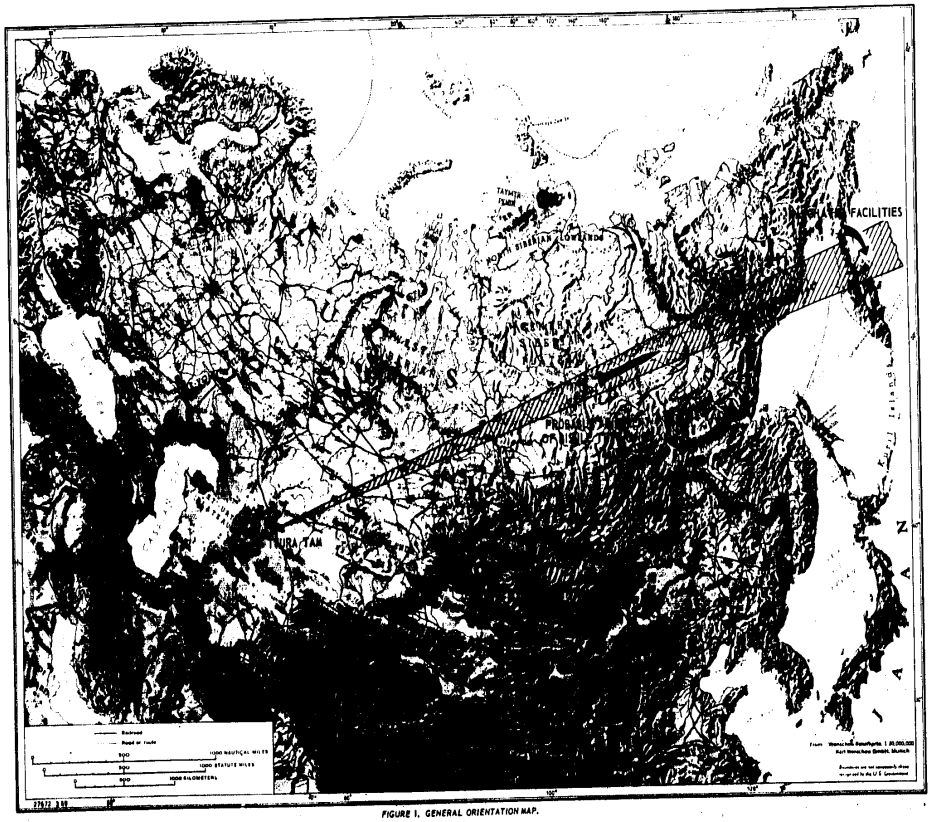

FIGURE 1. GENERAL ORIENTATION MAP.

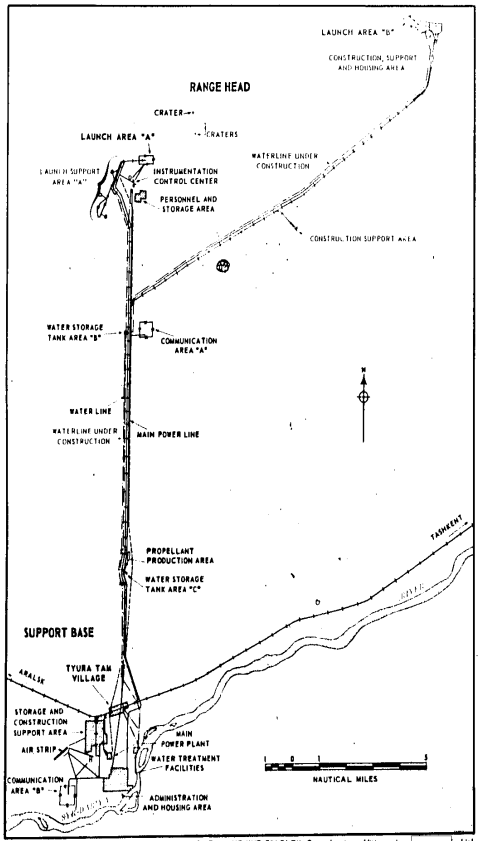

FIGURE 2. LINE DRAWING OF THE TYURA TAM MISSILE LAUNCHING COMPLEX. Green denotes additions since [redacted] which include a launch area under construction.

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INTRODUCTION

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The Tyura Tam Missile Launching Complex (Figure 2) was covered for the third time by aerial photography, on [redacted] The quality of the photography was good. However, the time of day, scattered clouds, and camera configuration precluded stereo examination and detailed study of parts of the general complex area, including some of the previously known existing facilities. Included in these conditions is the existence of a photographic "holiday" on the Tyura Tam coverage which consists of an intermittent gap in the photography several hundred feet wide usually directly beneath the vehicle. This holiday is inherent in the camera configuration used. It precludes complete analysis of some features as indicated on several graphics.

This report emphasizes new structures, construction activity, and changes noted on the recent photography, and the over-all effect of these additions and changes on the capabilities and functions of the Complex. As a basis of comparison for this report, HIA/JR-4/58 (September 1958) "Missile Launching Complex and Test Range, Tyura Tam, USSR", is utilized. The Complex is discussed in the same sequence as in the initial study except that a discussion of new features--three new rail-served areas, a launch area, a construction support and housing area, and a construction support area--is inserted prior to discussion of the support base facilities. In general, facilities will not be discussed in this report unless there has been some change in the interpretation. The color green is used on many of the drawings in this report to indicate new items or changes evident since the [redacted] coverage. Structures or items no longer present are not shown on the revised drawings.

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RANGE HEAD

The Range Head, located about 14 miles north of Tyura Tam village, occupies an area of some 50 square miles and consists primarily of two launch areas (Figure 2). Launch Area "A", together with its immediate support facilities is located at 45°55'N/63°18'E, while Launch Area "B", in early stages of construction, is located at about 46°01'N/63°33'E. Other major facilities include the Instrumentation Control Center and the Interferometer-Type Instrumentation Site (discussed in detail in the Guidance and Instrumentation section), the Construction Support and Housing Area which is associated with Launch Area "B", and a Construction Support Area apparently for general construction throughout the Range Head.

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LAUNCH AREA "A"

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Few modifications have been made in Launch Area "A" during the interval between overflights. It shows evidence of extensive use and it is apparent, from an analysis of the remainder of the Complex, that all firings at Tyura Tam prior to have taken place in this area. Re-analysis of the launching structure has resulted in a major revision of the concept of its structural design.

Figures 3 and 4 illustrate Launch Area "A" by means of a perspective rendering and photographic views of a model as conceived by the photo interpreter. The physical plant of the area has been enlarged to include a probable cascade facility, a probable cable conduit and passageway in diameter, and a support building (Figure 5). The probable cascade facility is positioned adjacent to the southwest corner of the Launching platform. The new conduit roughly parallels the old cable tray or personnel passageway. The new support building is located 400 feet northwest of the launching platform.

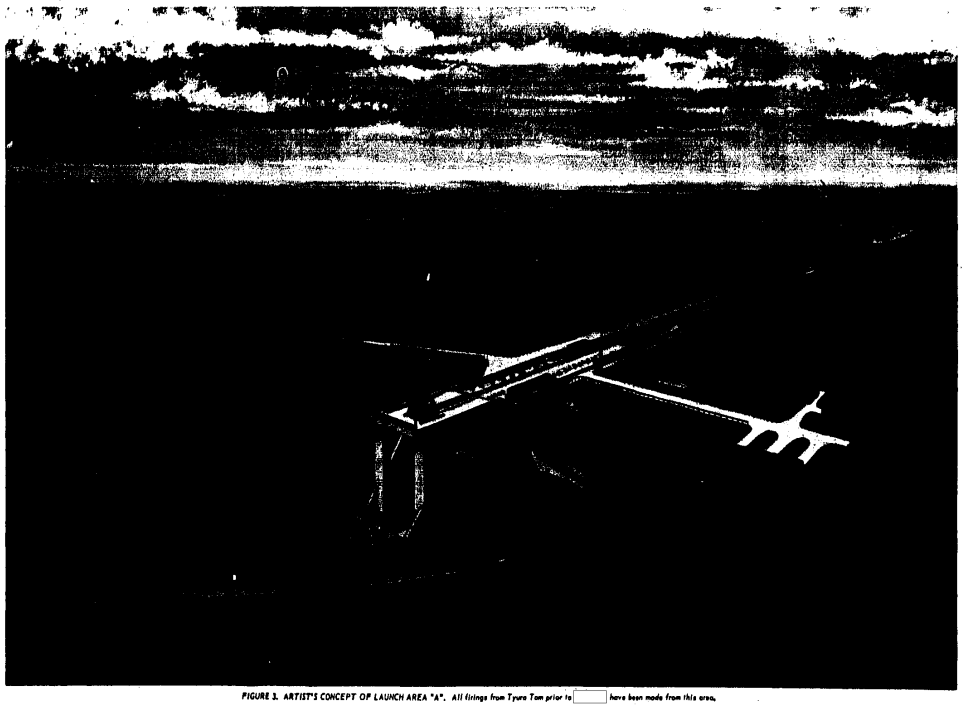

FIGURE 3. ARTIST'S CONCEPT OF LAUNCH AREA "A". All firings from Tyura Tam prior to here been made from this area.

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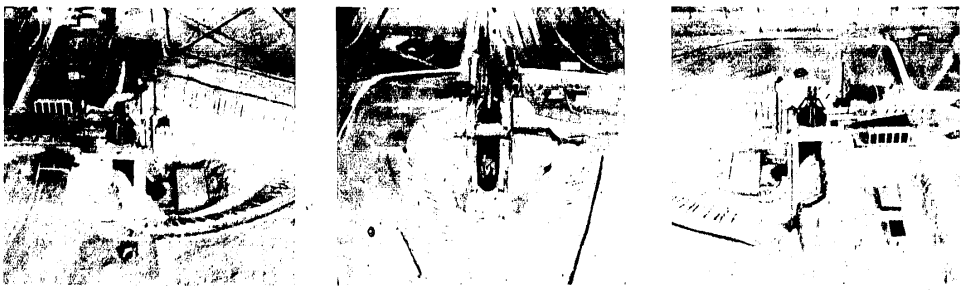

FIGURE 4. PHOTOGRAPHIC VIEWS OF MODEL OF LAUNCH AREA "A" Three photographs of a model, looking north, west, and south respectively, show the launching structure, servicing tower and pit.

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The dark area near the center of the launching platform is circular, regularly shaped, and measures about 65 feet in diameter. Although the nature of this area is undetermined, its well-defined edge indicates it is not blast scarring as initially thought. The launching platform is supported by two and probably four concrete pillars, each 30 feet wide, rather than two solid concrete abutments as originally reported. Other minor changes or revisions within the area will be noted in discussions of individual facilities which follow.

In a down range direction from Launch Area "A" four crater-like depressions, possibly indicative of missile malfunctions, have been identified. One of these craters was present on the [ ] photography, and if in fact it resulted from a missile malfunction, indicates that missiles were being launched from Launch Area "A" prior to [ ] One of the craters has the appearance of being made as the result of an explosion. However, none of the craters show evidence of burn scar. Locations of the craters with respect to the launching structure at Launch Area "A" are shown on Figure 2.

The crater present in [ ] approximately 60 feet in diameter, is located about 4 miles from the launching structure on an approximate azimuth of [ ] It is reached by a trail which leads out to it from the launch area and which appears to have been made solely to reach the crater. The crater has a precise circular pattern and is ringed by a low earth lip. This is suggestive of digging, which could have obliterated evidence of any explosion which may have occurred here. Both the appearance of the crater and the existence of the trail are indicative of activities of a salvage party.

Two craters, 30 and 35 feet in diameter and 175 feet apart, are located approximately 3.5 miles from the launching structure on an azimuth of about [ ] A trail, which branches from the trail to the crater discussed above, terminates in the vicinity of these craters. Around the 35-foot crater, earth has been thrown out radially as if by an explosion. As with the 60-foot-diameter crater, a low earth lip circling each crater is apparent, indicating possible salvage operations.

The fourth crater is an irregularly-shaped depression approximately 75 by 35 feet, possibly caused by two overlapping craters. It is located about 4.5 miles from the launching structure and on an approximate azimuth of 60 degrees. Salvage operations are also evident at this crater. Cloud cover precludes determining the precise alignment of a part of a trail leading to this crater.

Pit: The pit, 880 by 550 feet and [ ] feet deep from the top of the launching platform, retains its characteristic pear-shaped appearance. The comparative cover provides a basis for some revised measurements. The distance between the top of the launching platform and the first terrace level is revised from [ ] feet. The distance between terraces is confirmed at [ ] The distance between the lower terrace and the pit is revised from [ ] feet. This revises the depth of the pit from [ ] feet, measuring from the top of the launching platform. However, two concrete trenches, formerly identified as drainage sumps [ ] below the pit base, now measure [ ] below the pit base.

The pit shows evidence of many firings, either launch or static, since the [ ] overflights. This is indicated by its darker appearance and the erosion of its sides, which could result from engine blast. 25X1

The nine instrumentation stations and observation bunkers (items a through i, Figure 5) identified around the pit remain unchanged.

Launching Structure: The new photo coverage provides a basis for revising the mensural data on the launching structure and the concept of its structural design. Although this revision represents a more definitive structural analysis, many design characteristics remain undetermined.

The original dimensions of the launching platform, [ ] are revised to 135 feet square. The rail embankment terminates at an abutment measuring [ ] by 25 feet. There is a dark circular area about 65 feet in diameter positioned at the center of the 135-foot-square platform, and it is over this area that the servicing tower is positioned. 25X1

Rather than two concrete supporting

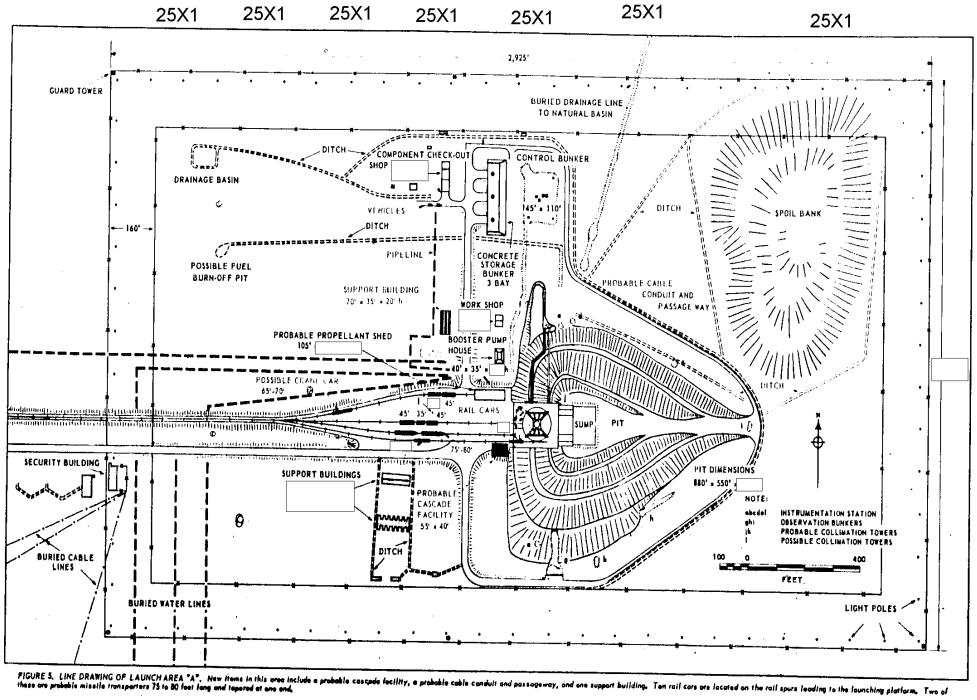

FIGURE 5. LINE DRAWING OF LAUNCH AREA "A". New items in this area include a probable cascade facility, a probable cable conduit and passageway, and one support building. Ten rail cars are located on the rail spurs leading to the launching platform. Two of these are probable missile transporters 75 to 80 feet long and tapered at one end.

abutments, the platform is supported by two and probably four concrete pillars, each 30 feet wide and separated by a distance of 55 feet (the thickness of these pillars could not be determined). The platform itself appears to be only about 10 feet thick in contrast with the original estimate of 50 feet. It is possible that the platform is supported on at least the two front pillars by some type of jacks or bearings.

A reanalysis of the launching structure at the pit base has resulted in several revisions. That part of the launching structure formerly called the "deflector plate" now appears to be part of the pit base construction. It is 60 feet wide and is flanked by two deep concrete trenches, formerly called drainage sumps, which extend from the base of the launching structure to an underground sump. The thickness of the two small retaining walls located at either side of the base of the launching structure has been revised from

Underground Sump: This sump, formerly called an "Unidentified Concrete Structure", is located at the base of the pit. The width of the sump has been revised from to 75 feet and the roof has an approximate upward slope from west to east. A structural reanalysis suggests that the sump may be subdivided into three compartments ea and a middle compartment The two concrete trenches,

wide, deep, and 60 feet long and separated by a distance of at least 60 feet, extend from the base of the launching structure to the two end compartments. At the end of the trenches nearest the launching structure are two objects which could be the ends of two sluiceways possibly utilized for propellant dumping. The foregoing factors indicate that the sump may have a twofold purpose: one, a collection sump for the flushing water used in live firings; and two, a dump sump for missile propellants. The sump face toward the launching structure rises vertically from the top of the trenches for at least 10 feet. Therefore, it is probable that a flame deflector is at a higher level than the top of the sump.

Facilities on the Launching Platform: The facilities on the platform are essentially unchanged with one exception. The rail spur which extended onto the north side of the platform appears to have been removed.

Servicing Tower: While the quality of the new cover does not permit an extensive reanalysis of the servicing tower, a clearer interpretation of the major features of the tower can be made (Figure 6). First, the tower is probably not of uniform width. From a width of at the top it probably widens at the bottom to a width sufficient to allow it to travel along the gantry tracks, apart. In addition, re-examination of the configuration of the eight struts supporting the tower indicates that four major struts probably are not straight but extend nearly vertically from points approximately feet from the center of the tower to a height of 25 to 30 feet, then bend sharply to meet the tower approximately halfway up. This configuration may facilitate the movement of large items of equipment in the vicinity of the tower base. The height of the tower and its width at the top remain the same, but the lower ends of the four major struts are positioned on the concrete launching platform just outside the 65-foot blackened circular area, and form a rectangle by 50 feet. Few details of the four minor struts can be discerned, although their lower ends appear to be positioned within the dark area.

Probable Collimation Towers: No change is noted in the positioning or configuration of the probable collimation towers (Figures 5 and 6).

Probable Liquid Propellant Handling Shed: The interpretation of a heavy construction design for this previously designated "probable propellant building" has been revised. Instead of being a hardened concrete structure, the new coverage indicates it to be a shed 105 (the original measurement of 120 feet was erroneous) by feet high which is open at least on the north side. There are six supports on this side equally spaced at intervals. The east end of the shed has earth embanked against it, but it would not afford adequate protection from an explosion at the nearby launching platform. Since the shed is entered by a rail line, it could be utilized as an immediate storage point for rail cars carrying propellant. The propellant loading and/or "topping" of an erected missile could be performed from this point via possible underground piping. The shed is probably not utilized as a missile hold or temporary storage facility.

Probable Cascade Facility: The probable cascade facility, measuring 55 by 40 feet, is positioned near the southwest corner of the launching platform and is approximately 135 feet from the servicing tower. There appear to be two banks of cascades, each with 8 to 10 tanks which individually measure approximately 40 by

Rail Cars: Ten rail cars are located on the rail spurs leading to the launching platform. Two of these are probable missile transporters measuring 75 to 80

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feet long and are tapered at one end. A possible rail crane car, 65 to 70 feet in length, with a raised portion at one end measuring [redacted] long is parked in the area. A possible engine or tank car 45 feet long, coupled to a possible boxcar [redacted] long, is parked near the probable propellant handling shed. The remaining five cars, one of which is standing on the launching platform, are not unusual in either configuration or size, and vary from 35 to 45 feet in length.

Control Bunker: The control bunker, 145 by 110 feet, is essentially the same except for one addition and two minor revisions. One of the unidentified objects or vents positioned on the northwest corner of the bunker has been removed. In this same corner the probable personnel entrance to the bunker has been identified. A new probable cable conduit and passageway [redacted] in diameter has been constructed. It becomes visible at a point on the edge of the pit [redacted] feet above the base of the pit, near where the old cable tray becomes visible. From there it makes two turns and connects with the launching structure at a point about 80 feet above the base of the pit or about 60 feet below the top of the launching platform. It is supported by several small vertical pillars whereas the old cable tray is unsupported. The total change in elevation of the new conduit is [redacted] and the straight line distance between the edge of the pit and its point of entry into the launching structure is [redacted] feet.

There is a revision of the initial analysis pertaining to the elevation of the bunker with reference to the elevation of the launching platform. Formerly the bunker top was thought to be well below the level of the launching platform, whereas a new terrain elevation analysis reveals the top of the control bunker to be only [redacted] below the level of platform.

Concrete Storage Bunker: The storage bunker, [redacted] is essentially unchanged. It consists of three storage bays, each 35 feet square, with two earth fills, each 35 feet wide, separating the three bays. While previous analysis indicated a two-level roof, it now appears to be uniformly [redacted] high. Each bay has a roof-vent and is served by a revetted concrete drive with wide-angle turns. The face of the bunker is a concrete wall approximately [redacted] wide. The bunker could be used for storing solid propellants as well as for storing other hazardous materials.

Component Checkout Shop: Formerly called the "Missile Checkout and Final Preparation Building", the new designation of this building is thought to more accurately describe its function. The appearance of this facility remains unchanged. However, the length of the south end-section measures 35 feet long as opposed to an erroneous original measurement of [redacted] he original north end-section feet is unchanged. The center section measures 50 feet in length, giving the building the same over-all length of [redacted] as originally indicated.

Support Buildings: One building, 70 by 35 feet, has been added to this group of buildings approximately 400 feet northwest of the launching platform. A probable pipeline adjacent to it runs north to the vicinity of the Component Checkout Shop.

Security Building: No apparent change.

Water Supply: A new probable covered pipeline extends to the northwest from the north side of the rail embankment near the Probable Liquid Propellant Handling Shed. It runs under the road embankment and continues on as an open ditch, terminating at a 15-foot-square open pit situated 90 feet southwest of the new support building. This may be a modification of existing water facilities.

Drainage Systems: Generally unchanged with the exception of additional open ditches near and around the earth spoil from the pit excavation.

Power Supply: No apparent change.

Communications Facilities: No apparent change.

Function of Launch Area "A": No apparent change.

LAUNCH SUPPORT AREA "A"

Newly designated Launch Support Area "A" (Figures 7, 8, and 9) includes the areas previously designated as Launch Support Area, Personnel and Storage Area, Vehicle Park, Water Storage Tank Area "A", and Possible Launch Area "B". It occupies an area roughly 2 miles long and a mile wide in the vicinity of the rail hook to the rear of Launch Area "A". For purposes of this report, Launch Support Area "A" is divided functionally into an operational section, a technical section, and a service section. Security throughout this general area ranges from a facility with maximum security -- i.e., two fences, guard towers, and light poles -- to unfenced facilities. The area is characterized by considerable activity and when compared to the previous coverage, appears complete. There are at least 65 rail cars in the area.

OPERATIONAL SECTION

This section includes support facilities which handle the actual missile or missile components and consists of Missile Checkout and Assembly Facilities Numbers 1 and 2. Each facility is rail-served and each contains a large rail drive-through building. In addition, each appears to have similar associated water, waste disposal, and steam/heat-producing facilities. A Possible Test Facility, formerly designated "Possible Storage Section", is included in the description of Missile Checkout and Assembly Facility No. 2 since it appears to be functionally and physically associated with that facility.

Missile Checkout and Assembly Facility No. 1: With the exception of the addition of two storage/shop-type buildings and two small miscellaneous buildings, this rail-served facility has not changed since previous coverage. It still contains the largest building in the entire Complex. This building, 395 by 105 feet and 70 feet high, is passed through by three rail lines and bypassed by one line. The width of 105 feet was revised from an original measurement of 95 feet. A 30-foot-wide shed parallels the entire west side. Missiles or stages of missiles are brought in on rail cars and assembled and probably checked out in a horizontal and/or vertical position. It is possible that at least three missiles can be handled simultaneously. There are indications that this facility must use an abundance of water since there appear to be water connections with Water Tank Storage Area "A" and with the large and now complete waste disposal facility west of the rail line.

Of the two new storage/shop buildings added to the facility, one, a gable-roofed building, measures 125 by 35 feet and is located to the northeast of the drive-through building. The other, a hip-roofed building, measures 160 by 55 feet and is located parallel to and on the west side of

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the drive-through building. North of and outside the solid board fence which encloses this facility is an open-storage area or junk yard.

Missile Checkout and Assembly Facility No. 2: This heavily secured facility, previously referred to as "Possible Launch Area 'B' ", is now thought to function in a checkout and assembly capacity since there is no evidence of missile launching facilities. The facility is well served by both road and rail. However, its rail connection is oriented toward Launch Area "A". In late stages of construction in [redacted] the facility now appears complete with very few changes. Six perimeter guard towers have been constructed between the two security fences. A facility having several similarities to this one is associated with missile activities near Vladimirovka. The detailed comparison of these two facilities will be presented in the forthcoming Kapustin Yar/Vladimirovka report. Description of individual items comprising Facility No. 2 follows.

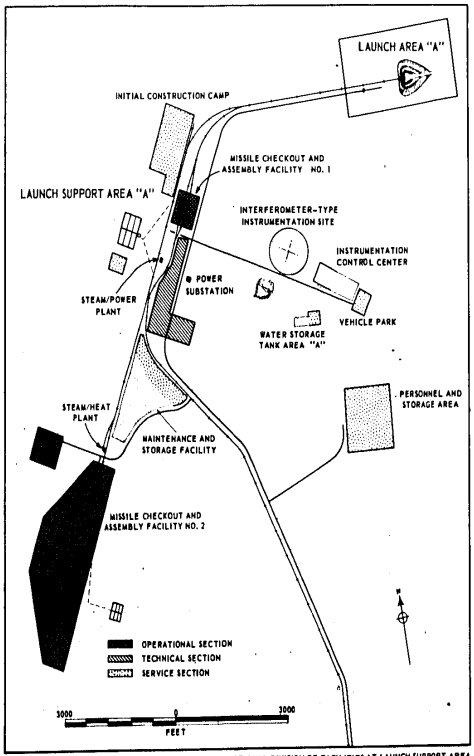

FIGURE 7. LINE DRAWING SHOWING THE LOCATION AND FUNCTIONAL DIVISION OF FACILITIES AT LAUNCH SUPPORT AREA "A". This area is complete, active, and contains at least 68 rail cars. Missile Checkout and Assembly Facility No. 2, previously designated "Possible Launch Area 'B' ", is similar to a missile assembly and checkout area near Vladimirovka, USSR.

The largest structure remains the monitor-roofed rail and road drive-through building (item 1) measuring 210 [redacted] with a monitor 175 by 60 feet. The over-all height is approximately 40 feet. One rail line passes through the building and one line bypasses the building on the east side. These two lines converge and terminate 1,200 feet south of the building. Since [redacted] hard-surfaced roads have been completed in the facility. Road as well as rail traffic passes through the large building, with the rail line imbedded in the portion of the road which runs through the building. On each end of the drive-through building is a turning road with a turning radius of [redacted] feet. The center area of the turning road on the north end is paved with a dark material which has the appearance of asphalt. On each end of the building are two masts or poles, which possibly function as lightning rods or as safety guide poles for rail or truck-transported loads which enter or leave the building. These poles are equidistant on either side of the road and rail line that pass through the building and are [redacted] apart and 20 feet from the building. A probable cooling tower, 10 feet square, is located approximately 80 feet southwest of the drive-through building. Previous photography showed a circular excavation at this point. A ground scar, 190 feet long, connects the drive-through building with a 20-foot-square building to the west. The purpose of this building is undetermined. Three small revetments have been constructed between the security fences approximately 200 feet west-northwest of the large building.

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No change is noted in the [redacted] foot gable-roofed building (item 2).

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Possible Storage Point (items 3 and 4), formerly identified as a "Possible Electronics Facility", appears unchanged except for the completion of the road serving it and the removal of the [redacted]-square building (item 5). It now consists of two road-served buildings, one individually fenced. It was originally thought to have a guidance or control function primarily because the over-all area was thought to be a possible launch area under construction. It is now believed to be a Possible Storage Point for materials or components which are small and of a critical nature.

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The three [redacted]-diameter storage tanks (item 6) have been covered with up to 5 feet of earth and each is now served by a hard-surfaced road. A tank car, [redacted] long, is on the railroad track near the buried tank at the south end of the drive-through building.

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The size of a support building (item 7) has been revised from [redacted] feet square to 20 by 10 feet, and a wide paved road now leads from it to the main service road. Possible security building (item 8) remains unchanged. Item 9, formerly iden-

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tified as a transloading building, is now believed to be a steam/heat plant, and although no pipelines are visible, it is thought to furnish steam and heat to the large drive-through building. Item 10 is a new building, 50 by 25 feet, located south of the drive-through building. (Item 10 was formerly used in IIA/JR-4/58 to identify five unidentified structures which do not appear on the new photography.) The water line (item 11) that was under construction from Water Storage Tank Area "A" to the vicinity of the drive-through building is now complete.

A six-bed waste disposal facility, 350 by 270 feet, has been constructed at the terminus of the drainage line (item 12) which originates in the vicinity of the drive-through building. This line was under construction in [redacted] and is now complete. A ditch, [redacted] wide, leads southeast from this waste disposal facility to a drainage pit 150 feet square.

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The outstanding features of Missile Checkout and Assembly Facility No. 2 are maximum security, a railroad and road drive-through building, unusual positioning with respect to other facilities, little change since [redacted] utilization of water, and a consolidation of structures within an extensive area of open but fenced terrain. These features together with the fact that the rail line is constructed so as to facilitate movement to and from Launch Area "A", deliberately bypassing Missile Checkout and Assembly Facility No. 1, suggest the following alternative uses of this facility.

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1. A facility where the upper stages of missiles are assembled and checked out prior to mating at the launch area. The following facts support this theory: (1) the smaller of the two drive-through buildings is located here; (2) there is direct rail connection with Launch Area "A" which bypasses Missile Checkout and Assembly Facility No. 1; (3) there is maximum security possibly relating to delicate components such as guidance packages and nose cones; and (4) [redacted] access indicates that small components may be trucked in and assembled on rail cars.

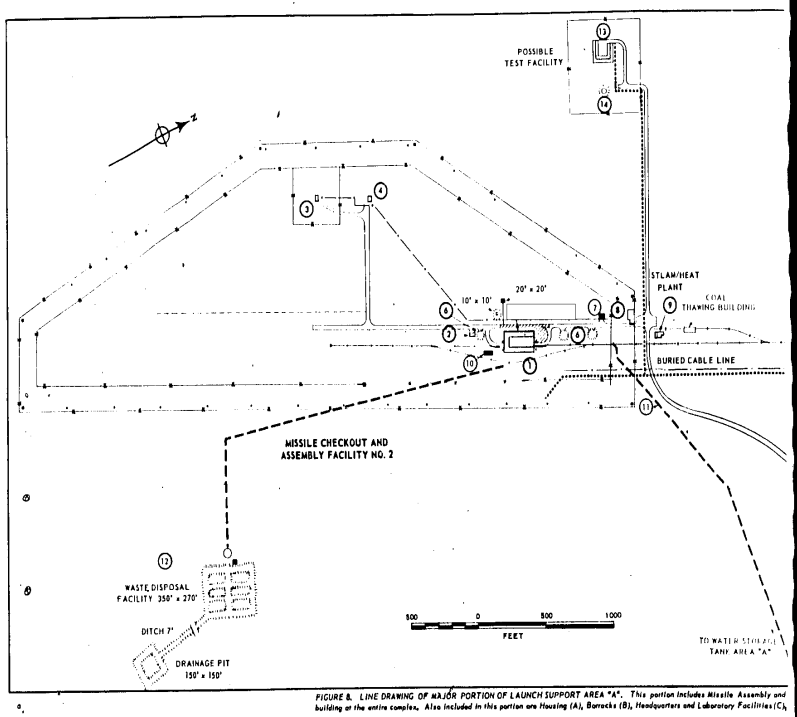

FIGURE 8. LINE DRAWING OF MAJOR PORTION OF LAUNCH SUPPORT AREA "A". This portion includes Missile Assembly and building at the entire complex. Also included in this portion are Housing (A), Barracks (B), Headquarters and Laboratory Facilities (C),

2. A facility where satellite vehicles are assembled and checked out. The following facts support this theory: (1) the facility is surrounded by extremely heavy security; (2) it is positioned out of the main rail support pattern; and (3) the area can be developed in a southward direction within existing fence lines for future projects.

3. A facility where "no-go" or static tested missiles from Launch Area "A" are inspected and reworked. This theory

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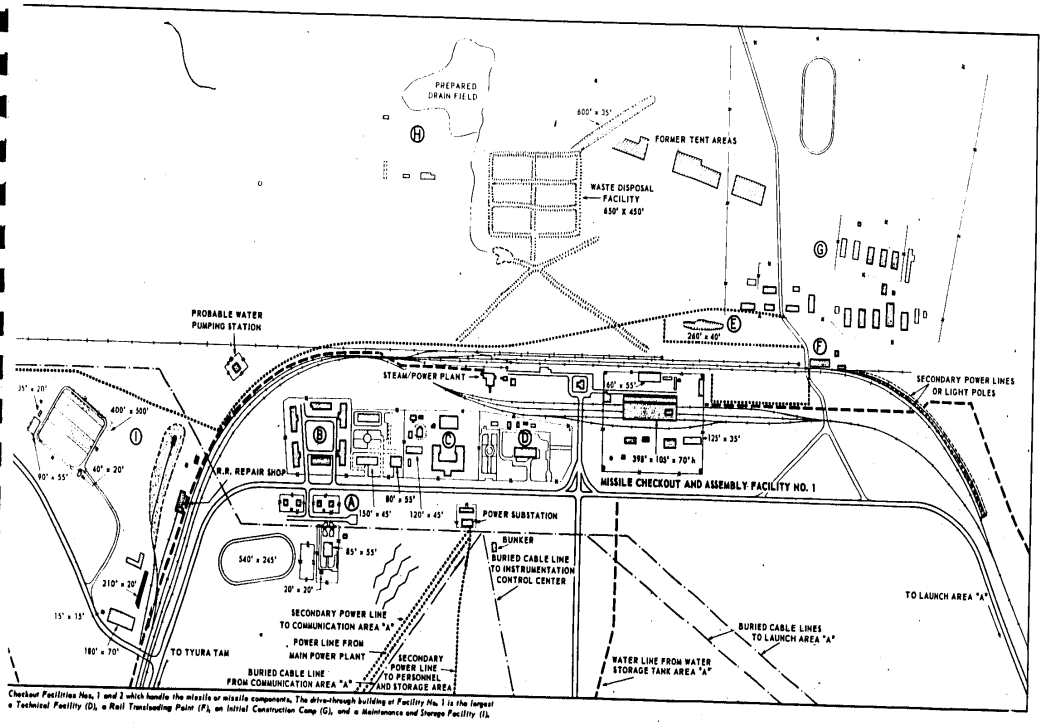

Checkout Facilities Nos. 1 and 2 which handle the missile or missile components. The drive-through building at Facility No. 1 is the largest a Technical Facility (D), a Rail Transloading Point (F), an Initial Construction Camp (G), and a Maintenance and Storage Facility (H).

is based on the existence of the direct rail connection between Launch Area "A" and Facility No. 2.

4. A facility that has been completed but not yet fully activated. This theory is based on the fact that (1) the area shows few signs of activity and (2) the facility has been completed but not expanded since the [redacted] coverage.

The Possible Test Facility (items 13, 14, and 15), formerly referred to as "Possible Storage Section," is now believed to be a test facility for small explosive-type experiments. It is possible that whatever is tested here could be stored in the Storage Point (items 3 and 4). A hard-surfaced road connects the two. This facility, substantially unchanged since [redacted] consists of a fenced area enclosing a large road-served, revetted concrete pad (item 13) and a bunker or covered tank (item 14). The small building (item 15) has been removed. The concrete pad, measuring 80 by 65 feet, is enclosed on three sides by a large earthen revetment. It is here where the experimenting or testing takes place. The bunker or covered tank, approximately [redacted] feet in

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diameter, has had the approach road to it completed. This may serve as temporary storage for the items tested at the pad.

TECHNICAL SECTION

This section includes facilities which support the technical activities at Launch Support Area "A" and Launch Area "A". It consists of six centrally located, road-served fenced compounds which cover approximately 20 acres. These six compounds contain at least 30 various-sized buildings, the arrangement of which indicates a well-planned layout. These compounds are identified as Housing (item A) and Barracks (item B) for technical personnel, Headquarters and Laboratory Facilities (item C), and an Unidentified Technical Facility (item D), previously referred to as "Possible Transloading and Storage Facilities." The general area is much cleaner than in and appears complete. However, there is room for expansion. Several small shacks have been removed.

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Housing (item A): Five small gable-roofed dwellings measuring feet, four of which were paired off and fence enclosed, formerly comprised this housing. A new gable-roofed building 85 by 55 feet, enclosed by a fence 315 by 140 feet, has been added. This building is possibly the residence of the rangehead administrator since it is well kept and appears to be landscaped. In the southeast corner is another new building 20 feet square. An athletic field, 540 by 245 feet, has been constructed just to the south of the new buildings.

Barracks (item B): Two new hip-roofed barracks measuring 150 by 45 feet, a plaza, and several black-topped roads have been added in the vicinity of six existing gable-roofed barracks which average 150 by 45 feet, and one hip-roofed building 80 by feet. The fence enclosing this compound measures 850 by 420 feet; any internal fencing has been removed.

Headquarters and Laboratory Facilities (item C): This originally consisted of one large C-shaped building measuring feet over-all, one gable-roofed building 140 by feet, and five smaller various-sized structures, to which have been added one gable-roofed building 120 by 45 feet and one smaller building 35 by 15 feet. The fence enclosing this compound measures 525 by 370 feet; all internal fencing has been removed.

SERVICE SECTION

The Service Section consists of those facilities which actually "serve" the Operational and Technical Sections of Launch Support Area "A". The Rail Transloading Point, Initial Construction Camp, Maintenance and Storage Area, Personnel and Storage Area, Vehicle Park, and the water and power facilities are the primary items comprising this category. Only those water and power facilities which are located in Launch Support Area "A" are discussed here.

Unidentified Structure (item E): The large wedge-shaped structure (item E) has been removed. Only a 260 by 40 foot open trench remains.

Rail Transloading Point (item F): The rail transloading point has been modified slightly in that a high combination building/tower with conveyor has been removed and a new conveyor has been added to the previously reported 40 by foot building. A long transloading building and a small shed remain intact.

Initial Construction Camp (item G): This camp is now being enclosed by a perimeter fence which encompasses about 60 acres. Inside the perimeter fence are two smaller fenced compounds. This fence together with six additional storage and barrack-type buildings, an athletic field, and vehicular activity indicates continued use of the camp. At least 25 various-sized structures are present at the camp.

Unidentified Area (item H): This unfenced area, not present in measures about 500 feet square and is located just south of the large waste disposal facility. It consists of four buildings and several groups of dark, unidentified objects, possibly vehicles. One building measures 75 by 30 feet with a 25 by 15 foot extension, one measures 45 by 20 feet, and one 35 by 15 feet. The fourth building, which measures 85 by 15 feet, is under construction. A rectangular excavation, 125 by 15 feet, may serve as a base or foundation for a buried or semi-buried structure. Much track activity is in this area although no paved roads serve it. The function of these dispersed and somewhat isolated buildings is probably for storage of seldom used items.

Maintenance and Storage Facility (item I): This facility, located generally between the two checkout and assembly facilities, is contained within a somewhat triangular-shaped area bounded on two sides by rail tracks and on the third side by a hard-surfaced road. This bounded area encompasses about 55 acres, of which 10 to 15 percent is being utilized. This area previously contained only a railroad car repair shop, a coal storage yard, and a water pumping station. New items within the area are a combined open storage area and motor pool and a possible vehicle maintenance area.

The combined motor pool and open-storage area, fenced and measuring 500 by 400 feet, has been added near the center of the triangular-shaped area. There are three associated buildings. One under construction is 90 by 55 feet, one is 40 by 20 feet, and the third is 35 by 20 feet. This facility is served by a graded road which curves to connect with the hard-surfaced road to the east.

The possible vehicle maintenance area, containing a large building 180 by 70 feet, has been constructed near the easternmost corner of the triangular-shaped area. The roof of this building is gabled at a very slight pitch and is separated by what appears to be three firewall projections across the width of the building. The roof is also well vented. It appears as though the function of this building may be associated with vehicle maintenance since there are approximately 20 vehicles of miscellaneous types parked near the building. However, this building seems unreasonably large for this purpose.

A structure 15 feet square and approximately 20 feet tall has been constructed 35 feet from the southern end of the large building previously mentioned. The top of this structure appears to be open. The relationship between these two structures cannot be determined.

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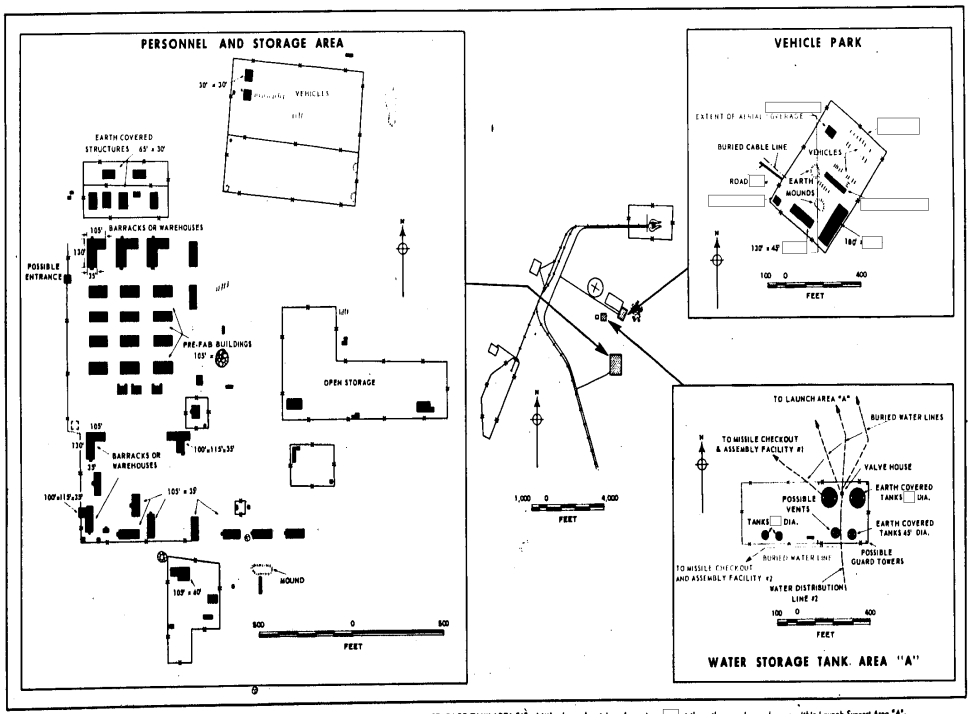

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FIGURE 9. LINE DRAWING OF THE PERSONNEL AND STORAGE AREA, VEHICLE PARK, AND WATER STORAGE TANK AREA "A". Little change has taken place since [redacted] of these three road-served areas within Launch Support Area "A".

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To the west of the large building and near its north end is a rectangularly-shaped stockpile measuring 210 by 20 feet. The pile arches, and is 25 feet tall at its highest point. The contents of this stockpile could not be identified due to the scale and resolution of the photography. An L-shaped gable-roofed building has been constructed 280 feet west of the large new building.

Personnel and Storage Area: The Personnel and Storage Area (Figure 9) reveals no significant changes subsequent to previous photographic coverage. Sixteen buildings of varying sizes have been removed and three new buildings have been added. A lessening of security measures is exhibited by the fact that an extensive amount of security fencing has been removed throughout the area. The function of this area is the same as previously established.

Vehicle Park: Due to the holiday in the photography only two large buildings

near the southernmost end of the installation are visible (Figure 9). There is no change in these structures or in this portion of the fenced enclosure.

Water Facilities: The only major changes in the water facilities at the launch support area, which in consisted of Water Storage Tank Area "A", a water pumping station and a waste disposal facility (previously called a water treatment facility) under construction, are the completion of this facility and the construction of a new one.

The water line connecting Water Storage Tank Area "A" with Missile Checkout and Assembly Facility No. 2 is complete.

The completed disposal facility, located in the vicinity of Missile Checkout and Assembly Facility No. 1, consists of six treatment beds with an over-all measurement of 650 by 450 feet. A long, wide ditch, 600 by 35 feet, extends northward from the perimeter ditch of the disposal facility. Also new to this facility is a prepared drain field which is connected to a pond near the skimmer by a natural drain.

The new disposal facility, located at the end of a drainage line (item 12, Figure 8), is associated with Missile Checkout and Assembly Facility No. 2. It consists of six treatment beds having over-all dimensions of 350 by 270 feet. A ditch wide and 860 feet long leads south from the disposal facility to a drainage pit 150 feet square.

Power Facilities: The power facilities at the launch support area consist of a sub-station, a steam/heat plant (previously identified as a transloading building) and a steam/power plant. The sub-station, which receives power from the main power plant and distributes it to the consuming facilities by overhead lines and buried cables, is now fenced. The steam/heat plant (item 9, Figure 8) is located near the entrance of the Missile Checkout and Assembly Facility No. 2. It measures 65 has a pile of coal near it, and is served by a short rail siding over which is located a possible thawing building, 100 by 25 feet. Although no pipelines are visible between this plant and the large drive-through building, it is believed that this plant provides either steam or heat to the large building.

The steam power plant may serve the other large drive-through building at Missile Checkout and Assembly Facility No. 1 in a similar manner as well as providing a standby source of power.

LAUNCH AREA "B"

Launch Area "B", when completed, will be a second large rail-served ballistic missile launching and static test facility at the Tyura Tam Missile Launching Complex (Figures 10 and 11). Construction within the new launch area proper is barely advanced to a point where it can be determined that there will be certain characteristic features similar to Launch Area "A". Figure 12 is an artist's concept of how Launch Area "B" may appear when completed.

The new launch area is located at the

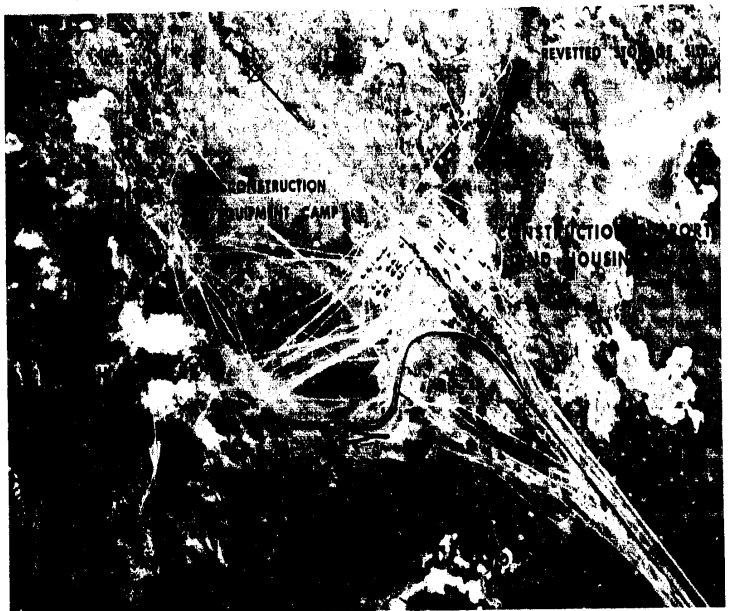

FIGURE 10. PHOTO ENLARGEMENT OF LAUNCH AREA "B" AND CONSTRUCTION SUPPORT AND HOUSING AREA. This second road and rail-served launch area is the most significant addition to the Tyura Tam Missile Launching Complex since the coverage.

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FIGURE 11. PERSPECTIVE OF LAUNCH AREA "B". Features shown are the large pit, partial construction of the launching structure, a tank-like structure, and an excavation for a control bunker.

FIGURE 12. CONCEPT OF LAUNCH AREA "B" WHEN COMPLETE. The indications are that this launch area, when complete, may appear quite similar to Launch Area "A".

apparent terminus of a new 15-mile-long single-track rail line which branches from the rail line leading to Launch Area "A". Paralleling this new rail line is a 25-foot-wide roadway under construction and a ditch, approximately 5 feet wide, for a water line. It is probable that this water line ties into Water Storage Tank Area "B" (see Figure 22), which was under construction in [redacted]. If so, it indicates that Launch Area "B" was probably in the original plan for the Complex.

The launch area and launching facilities, as well as a projected internal rail line, are orientated northwestward on an azimuth of [redacted] degrees. The area contains a large pear-shaped pit, a launching structure, a control bunker excavation, a tank-like structure, a large building, and several noteworthy miscellaneous features also in varying stages of construction (Figure 13).

The launch area is enclosed by a single fence except along the northeast side where construction vehicles gain access to the area. The fenced area is rectangular in shape, measures 4,400 by 1,325 feet, and covers about 135 acres. At Launch Area "A" the outside fence measures 2,925 [redacted] feet and encloses about 110 acres while the inside fence measures 2,605 by 1,300 feet and contains about 80 acres. Guard towers and a security building are not yet in evidence at Launch Area "B", while at Launch Area "A" physical security consists of six guard towers, a security building, and a double fence with light poles.

The rail line, which enters the new launch area at the southeast end, terminates near the large building that is under construction. This rail line will undoubtedly be extended to the launching structure, but its characteristics, including possible elevation and number of terminal spurs, cannot be determined.

The ditch for a water line roughly parallels the new rail line but terminates at a point on the rail embankment outside the fence area (Figure 10). There are no ground scars to indicate a projected alignment. No communication facilities, land lines, or buried cables are visible and are probably yet to be constructed. There is no evidence of underground construction or tunneling at the launch area.

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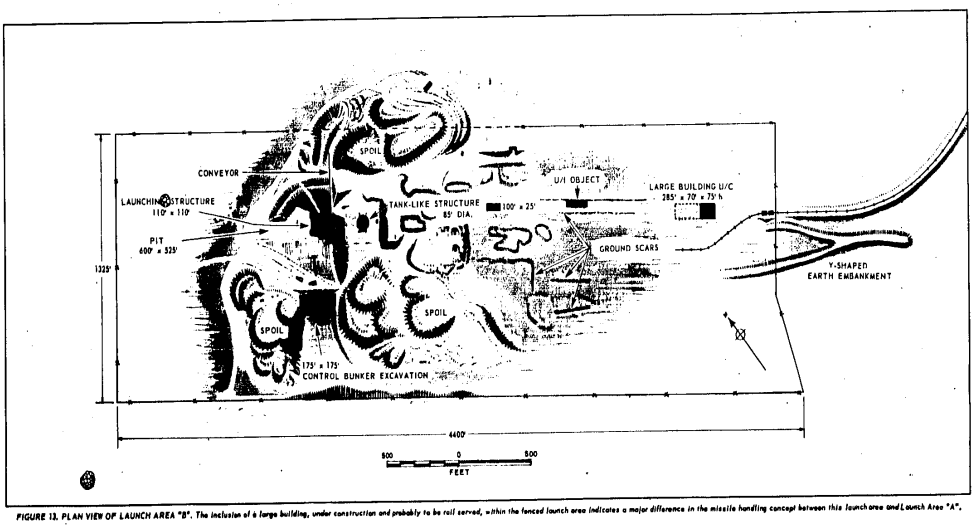

FIGURE 13. PLAN VIEW OF LAUNCH AREA "B". The inclusion of a large building, under construction and probably to be rail served, within the fenced launch area indicates a major difference in the missile handling concept between this launch area and Launch Area "A".

A conveyor appears to be in use on the northeast side of the pit, leading from within the pit through a cut in the edge of the pit, to a large spoil bank. One and possibly two other cuts or roadways have been dug into the edge of the pit and may have been similarly used (Figures 11 and 13).

Pit: The pear-shaped pit measures about 600 by 525 feet and is oriented along a northwest/southeast axis. The pit is being excavated and its deepest point, estimated to be about 100 feet below ground level, probably has been reached. Measurements on the pit at Launch Area "A" are 880 by 550 feet and the base is [redacted] feet below the top of the launching platform. Terraces, similar to those at Launch Area "A", have not yet been developed. A construction road enters the pit from the northwest edge and leads to the base of the pit where the launching structure is being constructed. The pit is not yet symmetrical in shape and more work has been done on the southwest side than the northeast side. Several unidentified objects, possibly construction equipment and/or maintenance sheds or material, are located on the lip of the southwest side (Figures 11 and 13).

Three large spoil banks are located in the immediate vicinity of the pit. Much of the spoil has come from the pit but some has come from additional excavations in the launch area. Some spoil will undoubtedly be used as back fill around completed structures while other spoil could be used to construct a railroad embankment if one is planned.

Launching Structure: A launching structure is being constructed near the southeast end of the pit. While only one side can be measured with any degree of accuracy (110 feet), it appears to be square (Figure 14). The corresponding portion of the launching structure at Launch Area "A" is believed to be 115 feet square.

The vertical members, of which only the front two are visible, are either concrete pillars or forms for concrete pillars which measure about 25 feet square and about 65 feet high. The horizontal members, again only two being visible, are about 15 feet wide and intersect the vertical members at a point about 45 feet above the base of the pit.

The rear wall is probably solid but it cannot be determined if the sides will be open, partially open, or solid. The front undoubtedly will be open since the flame and blast will be channeled in this direction. It is probable that a portion of a curved flame deflector plate has already been constructed in the center of the launching structure. There is no evidence to indicate it will protrude beyond the front of the launching structure. Heavy shadows preclude a more detailed examination of this launching structure. Along the southwest side of the structure are other shadows from either framing, bracing, or construction members.

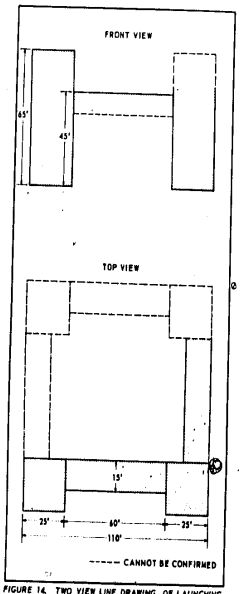

FIGURE 14. TWO VIEW LINE DRAWING OF LAUNCHING STRUCTURE AT LAUNCH AREA "B". Portions of two and probably four unfinished pillars which will support the launching platform are evident on the photographs. They appear similar in size and spacing to those supporting the launching platform at Launch Area "A".

Control Bunker Excavation: A 175-foot-square excavation for a control bunker is located about 425 feet to the left of the launching structure and directly opposite the approximate center of the structure. The completed control bunker at Launch Area "A" measures 145 by 110 feet and is 600 feet to the left of the launching structure. As nearly as can be determined, it appears that the two control bunkers will be similar in size, shape, orientation, and location with respect to the launching structures. A large dark unidentified area about 50 by 45 feet is located on the bottom and near the forward wall of this excavation. At present there are no visible signs of any connection between this excavation and the pit or launching structure. No accurate depth measurement of the excavation is possible.

Tank-like Structure: A large circular, reinforced tank-like structure, approximately 85 feet in diameter and under construction, is located 250 feet to the rear of the launching structure. It is situated in an excavated area about 200 feet square. The top of the tank (estimated height 25 feet) is about at ground level. No similar structure was identified at Launch Area "A", since, if there, it would be located beneath the rail tracks and embankment. The heavy reinforcing which appears to surround the tank could indicate that eventually it will be buried and therefore lie beneath the projected railroad since it is in line with the launching structure and a large building under construction which is a probable rail drive-through building. A possible function of this tank is water storage for flushing the flame deflector plate in the launching structure; however, no pipeline scars are visible leading either into or out of the tank. Several unidentified objects, possibly associated with construction, are located near the tank in the excavation.

Large Building Under Construction: This building, which measures 285 by 70 feet and 75 feet high, is located about 2,200 feet to the rear of the launching structure. Of its length, 110 feet is roofed and the vertical supports are emplaced for the remainder of the building. The rail line has not yet entered the building, but rather, it swings around to the southwest side and terminates. The location and orientation suggest it will be a railroad drive-through building and probably perform a function similar to the drive-through buildings at Missile Checkout and Assembly Facilities Numbers 1 and 2 located in Launch Support Area "A". The dimensions of these buildings are 395 by 105 by 70 feet high and 210 by by about 40 feet high.

Miscellaneous Items at Launch Area "B": Several miscellaneous items, located in and around Launch Area "B", have been identified. These are a Y-shaped earth embankment, a shallow excavation, and several long linear ground scars.

The Y-shaped earth embankment is located near the large building at the southeast end of the launch area. Its over-all length is 1,100 feet. The launch area fence intersects this embankment, with most of the embankment falling outside the fenced area. This embankment appears to have been caused by vehicles driving up one leg of the "Y", dumping at the end of the stem and returning by way of the other leg. Its function is not known.

The shallow excavation is irregular in shape and located between the tank-like structure and the large building. There is no indication as to its function or ultimate configuration and, if the railroad is projected to the launch structure, it will lie beneath the tracks. A shed-type building, 100 by 35 feet, is located near this excavation.

Several long dark linear ground scars or ditches are also located between the tank-like structure and the large building. A large dark unidentified object is located along the longest scar.

Guidance and Instrumentation: No guidance and/or instrumentation facilities have been identified at Launch Area "B" and it is highly unlikely at this stage of construction that these critical items would be emplaced. A logical location for an interferometer-type instrumentation site and an instrumentation control center, if patterned after Launch Area "A", would be within the "hook" of the railroad. It is possible however, that several facilities specifically associated with Launch Area "A" could be used in conjunction with missiles fired from the new launch area.

COMPARISON OF RAIL HOOKS

The rail lines which serve Launch Area "A" and Launch Area "B" have a unique "hook" configuration near their termini (Figure 15). The functional aspect of these hooks is not apparent. They do, however, provide an undisturbed and semi-protected area, in which, in the case of Launch Area "A", is located the Instrumentation Control Center. Neither "hook" duplicates the exact configuration of the other. However, certain similarities are evident. The actual "hooks" are different in size but several distances remain constant. These are: (1) the rail line distance of 3 miles between the launching structure and the first curve on the approach to the launch area and (2) a straight line distance of about 13,000 feet between these two points. There are no ground features other than the curve at the 3 mile mark and no significance can be attributed to this distance or mark.

The concentric circles at half mile intervals on Figure 15 indicate the location of support facilities with respect to

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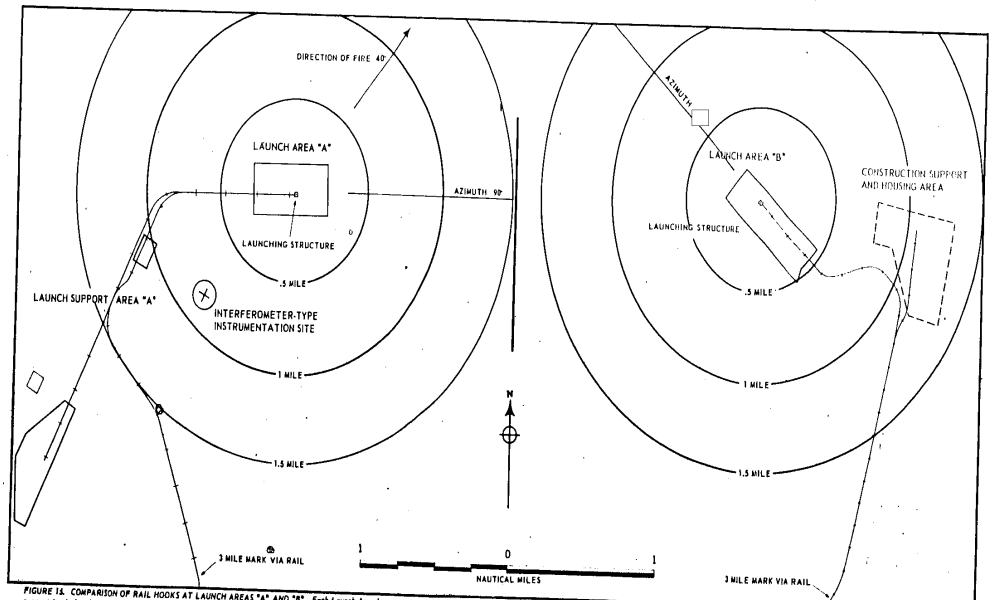

FIGURE 15. COMPARISON OF RAIL HOOKS AT LAUNCH AREAS "A" AND "B". Each Launch Area has an unique rail hook, different in configuration, associated with it. Locations of support and instrumentation facilities with respect to each launch point are shown by concentric circles drawn at half-mile intervals. The orientations of Launch Areas "A" AND "B" is also depicted.

the launching structures. It should again be stated that Launch Area "B" is located about nine miles east and four miles north of Launch Area "A" and is generally oriented along an azimuth of [redacted] degrees.

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CONSTRUCTION SUPPORT AND HOUSING AREA

The Construction Support and Housing Area (Figure 16), located about one mile east of Launch Area "B", supports the construction activity at this launch area. The general area is unfenced, rail-served, and covers approximately 135 acres. It consists primarily of permanent-type housing, fenced and partially fenced open and covered storage and maintenance facilities, motor pools, and a construction material dump. This area is marked by considerable track activity both internally and between it and the launch area. Several tracks and trails lead from this area to three other areas of activity.

Housing Area: This area contains 16 permanent-type, one and one half story buildings, five of which are under construction. Fourteen, which have an average size of 140 by 55 feet, are arranged in two groups of seven buildings each. This area houses the construction workers and probably also houses the necessary support facilities, such as administration, messing, and recreation. Since this area is of a permanent nature, the buildings will probably also be used by permanent-type personnel who will be stationed at the launch area when it is completed. Extensive earth scarring and numerous small dark unidentified objects are located around this area.

Storage and Maintenance Facility: This facility covers a partially-fenced area, 1,450 by 850 feet (approximately 30 acres), on the east side of the rail spur which serves the Construction Support and Housing Area. At present, this facility consists of 11 buildings of which 4 are gable-roofed and measure 140 by 35 feet; 4 are hip-roofed and measure 120 by 40

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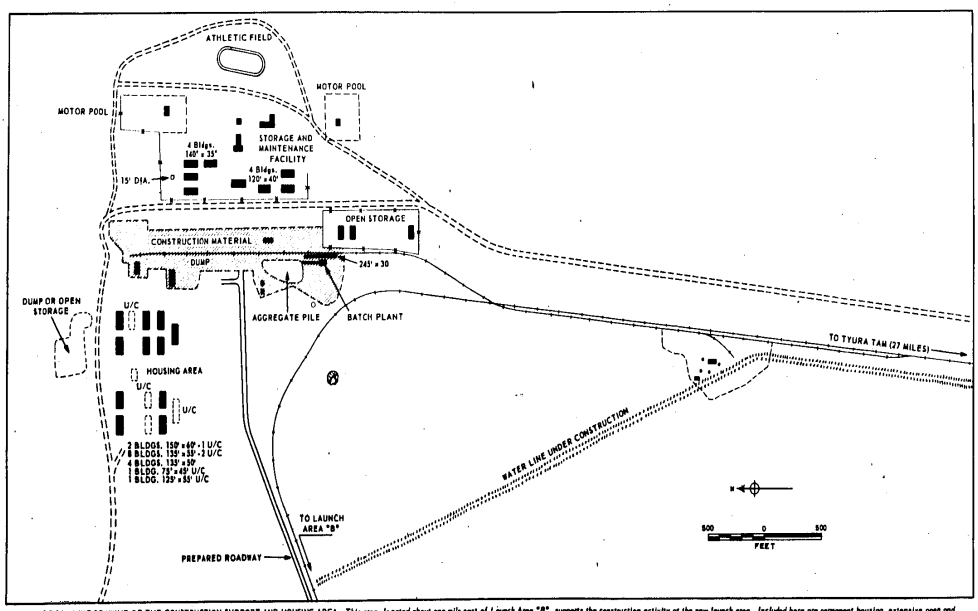

FIGURE 16. LINE DRAWING OF THE CONSTRUCTION SUPPORT AND HOUSING AREA. This area, located about one mile east of Launch Area "B", supports the construction activity at the new launch area. Included here are permanent housing, extensive open and covered storage and maintenance facilities, motor pools, a batch plant, and a construction material dump.

feet; one is T-shaped and measures 140 by 85 feet over-all; one is L-shaped and measures 145 by 100 feet over-all; and one is 25 feet square. A possible tank about 15 feet in diameter is also located here. This facility can at least double in size according to present positioning and spacing of buildings.

Construction Material Dump: This dump is located on either side of the rail spur which serves the Construction Support and Housing Area. It consists of piles of unidentified construction material, a batch plant with conveyor, and at least five various-sized buildings. Five possible rail cars are located here. This dump also serves as a transfer point for construction materials from rail to road.

Motor Pools: Two motor pools, one on either side of the storage and maintenance facility, are in the area. The one on the north side is partially fenced, covers an area 550 by 280 feet, and consists of one building 50 by 35 feet and at least 30 vehicles or pieces of equipment. The one on the south side is unfenced, covers an area 280 by 210 feet, and consists of one building 55 by 25 feet and at least 15 vehicles or pieces of equipment. An athletic field 420 by 200 feet is located between the two motor pools.

Open Storage: The open storage is located in a fenced area 900 by 280 feet east of and adjacent to the rail spur. Within the fence are small stacks of unidentified materials, three gabled-roofed buildings with an average measurement of 100 by 35 feet, and several possible vehicles.

Activity on the New Rail Line: A spur leaves the rail line serving Launch Area "B" to serve the Construction Support and Housing Area. Another short spur leads to an area of considerable activity containing numerous dark unidentified objects. On these spurs and the rail line leading to the launch area there are about 35 rail cars including the five possible

cars already mentioned in the construction material dump. On the rail line, near the point where it branches from the line serving Launch Area "A" (see Figure 2), are 13 box cars, 2 tank cars, and 25 gondola/flat cars. A small hip-roofed building, possibly a switch house measuring 45 by 35 feet, is located about 1,200 feet north of the switch.

Other Activity: Three areas of activity, outside the general area served by rail, are connected by vehicle track or trail to either Launch Area "B" or the Construction Support and Housing Area or both (see Figure 10). These three areas, a quarry, a revetted storage site, and a construction equipment camp support the operations at the rail terminal.

The quarry, connected by track to the launch area, is located in a rock outcrop approximately 3,000 feet west of the launch area. It is only a small operation and there are no signs of activity.

The revetted storage site, connected by track to and located approximately one mile east of the Construction Support and Housing Area, may be used or has been used to store explosives used in the construction work. The site is not fenced or otherwise secured and consists of two roughly rectangular revetted areas which average 125 by 75 feet. One revetted area contains a building or hut about 55 by 30 feet; the other area appears to contain an excavation possibly for another similar building. There are no signs of activity at this site.

The construction equipment camp, consisting of approximately 60 vehicles or pieces of equipment, is located between and connected by tracks to both Launch Area "B" and the Construction Support and Housing Area. The camp is unfenced and is characterized only by extensive vehicular trackage. No maintenance facilities are present.

CONSTRUCTION SUPPORT AREA

The Construction Support Area (Figure 17), is an unfenced facility located about 9 miles southwest of Launch Area "B". It is positioned on the right of the new rail line, the prepared roadway, and the water pipeline ditch which leads to Launch Area "B". The area is served by one rail spur which enters from the direction of Tyura Tam. At a point approximately 2,000 feet from the rail line, the spur divides into two other spurs and forms a "V" with legs about 2,000 feet long. Five cars, varying from 35 to 50 feet in length, are standing at the end of one spur. Each spur has a short siding which is also serviceable. Branching from the left spur of the "V" is a possible branch spur under construction. No improved roadway enters this area. There are, however, many unimproved roads and vehicle tracks evident throughout the Construction Support Area.

In the area is a batch plant or crusher, a gravity-type rail-car unloading pit with conveyor, 3 bulk transloading buildings, 9 buildings of undetermined use, and 2 sphere-like objects. Supplies in open storage are scattered throughout the area.

North of the area three short ditches have been dug from the water line ditch, through the prepared roadway and under the rail line. The purpose and any further extension of these ditches are not apparent.

The unimproved roads, vehicle trackage, and the batch plant or crusher, together

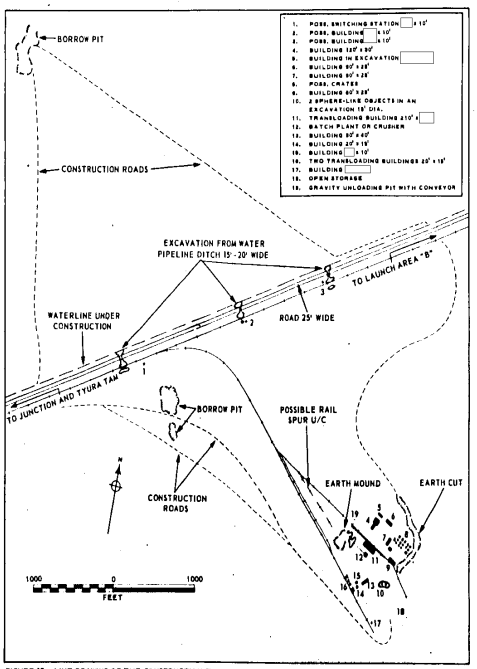

FIGURE 17. LINE DRAWING OF THE CONSTRUCTION SUPPORT AREA. This rail-served area, located about 9 miles southeast of Launch Area "B", provides or processes material for the construction of the new roadway and rail bed serving Launch Area "B". It may also support other construction activities in the Range Head.

with three borrow pits located in the general vicinity suggest that this area provides or processes materials necessary for the construction of the prepared roadway as well as for the railroad bed. Notwithstanding the construction support facilities adjacent to Launch Area "B", the facilities found here could also furnish support for the development of the launch area or other construction in the Range Head.

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SUPPORT BASE

The Support Base, as treated in HTA/JR-4/58 (Figure 18), remains the primary supply and transloading point for the Complex. It contains administrative facilities, personnel housing, and facilities for water treatment, power production, rail transloading, and miscellaneous storage. However, to facilitate organization of this report, all support facilities for the Complex, other than those at the Ranga Head, are discussed under the Support Base. These include facilities for propellant production and storage, power production and distribution, water treatment, storage and distribution, and communications.

FIGURE 18. PHOTOMOSAIC OF THE SUPPORT BASE. This area contains the primary logistical and administrative support facilities for the Complex. These facilities have undergone an orderly and apparently well-planned expansion since [redacted] with improvements evident in the water treatment facilities, the main power plant, and the airfield.

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ADMINISTRATION AND HOUSING AREA

Expansion of the Administration and Housing Area, foreseen in HTA/JR-4/58, is described below.

Permanent Housing Section: The permanent housing section with its associated administration and support buildings (originally 450 acres containing 225 major structures) has been enlarged to include an additional area in excess of 10 acres containing some 32 new buildings completed and 14 probable administration-type buildings under construction. The number, types, and floor space in square footage of the new completed buildings are as follows:

22 Administration-type	181,500
3 Personnel housing-type	17,000
7 Storage and shop-type	7,800
	206,300

Total floor space of the new total of 257 completed buildings, ranging from one to three stories inheight, is 1,608,000 square feet.

Motor Pool: Approximately 170 vehicles are present, double the [redacted] count of 85.

Possible Laboratory or Utility Section: No change.

Tent Area: All the tents have been removed from this area.

TYURA TAM AIRFIELD

The runway at Tyura Tam Airfield has been given a blacktop surface 3,815 by 140 feet. There is also a new blacktop taxiway 965 by 35 feet leading to a 1,540 by 210 foot hardstand paralleling the runway. A new service apron 155 by 100 feet is located adjacent to the taxiway. Two hard-surfaced helicopter pads, approximately 75 feet in diameter, are located east of the aircraft dispersal area. Aircraft present are 3 CRATE, 6 CAB, 3 COLT, 2 CREEK, and 5 HOUND. Two planes and five planes were present on the two previous coverages.

The two buildings present in [redacted] remain unchanged. Two buildings, 155 by 35 feet and 95 by 35 feet, are under construction 550 feet east of the hardstand. In addition nine other new miscellaneous buildings are located throughout the general area. A new hard-surfaced road approximately 20 feet wide extends from the airfield to Communication Area "B" and the Administration and Housing Area. A ditch extends from the two buildings under construction to Communication Area "B".

COMMUNICATION AREAS "B" AND "C"

Communication Area "B" which is located approximately two miles west of the Administration and Housing Area reflects no significant change from its appearance in [redacted] In Communication Area "C", located adjacent to the Water Treatment and Distribution Facilities, the 55-foot mast which was positioned next to the gable-roofed building has been removed. Otherwise the area remains unchanged. A detailed description of those areas is given on pages 31, 32, and 33 of HTA/JR-4/58.

WATER TREATMENT AND DISTRIBUTION FACILITIES

The new analysis of these facilities is included under the major topic heading Water Treatment, Storage, and Distribution Facilities.

• • •

Rail-served facilities at the Support Base remain the primary logistical support and supply points for the Complex. Improvements to or expansion of these facilities are discussed in detail below.

STORAGE AND CONSTRUCTION SUPPORT AREA

The expansion of the Storage and Construction Support Area (Figure 19) is reflected in the comparative coverage of the area. The area contains a variety of open and covered storage and transshipment warehouse-type buildings. Seven new rail sidings have been added and one removed subsequent to the [redacted] aerial coverage. Numerous small workshed-type buildings, not shown on Figure 19, have been razed, moved, or newly built throughout this area.

Probable Fuel Storage Section (item A): Seven new cylindrical tanks, four [redacted] and three 30 by 5 feet, have been added to this fenced, rail-served section. There are 14 vehicles parked in the area adjacent to the fuel storage compound.

Open Storage Section (item B): Formerly called a "Possible Crate Storage Section", this new designation is believed to more accurately describe its function. Located in the section are 15 stacks of unidentified material varying in length from 55 to 85 feet by about 15 feet wide which were formerly referred to as possible crates. This represents nine fewer than there were in [redacted] this section has been enlarged and a new rail siding to service it has been laid. Situated in the new portion of the section are 16 stacks of material measuring 20 feet square which might be lumber. Additional nondescript piles of supplies are scattered throughout the section.

Warehouse Section (item C): This section, enclosed by a fence 1,800 by 1,250 feet, contains at least 35 various-sized buildings. The following is a tabulation of the more significant ones:

13 Prefab-type, 160 by 80 feet, road served
6 Gable-roofed, 80 by 48 feet, road served
4 Gable-roofed, 200 by 85 feet, road and rail served
2 Gable-roofed, 100 by 100 feet, road and rail served
2 Gable-roofed, 70 by 40 feet, road served

Two prefab-type buildings which were previously considered under construction have been removed. Four sidings from the rail line which serves the main power plant terminate within this section. One additional siding terminates within a new fenced area 190 by 155 feet located south of the Warehouse Section. There are three 30-foot rail cars parked near the terminus of this short siding.

Bulk Fuel Storage Area (item D): No changes are noted.

Unidentified Building (item E): The L-shaped building and the small building directly to the east are now enclosed by fencing. The spherical-shaped objects near this building have been removed.

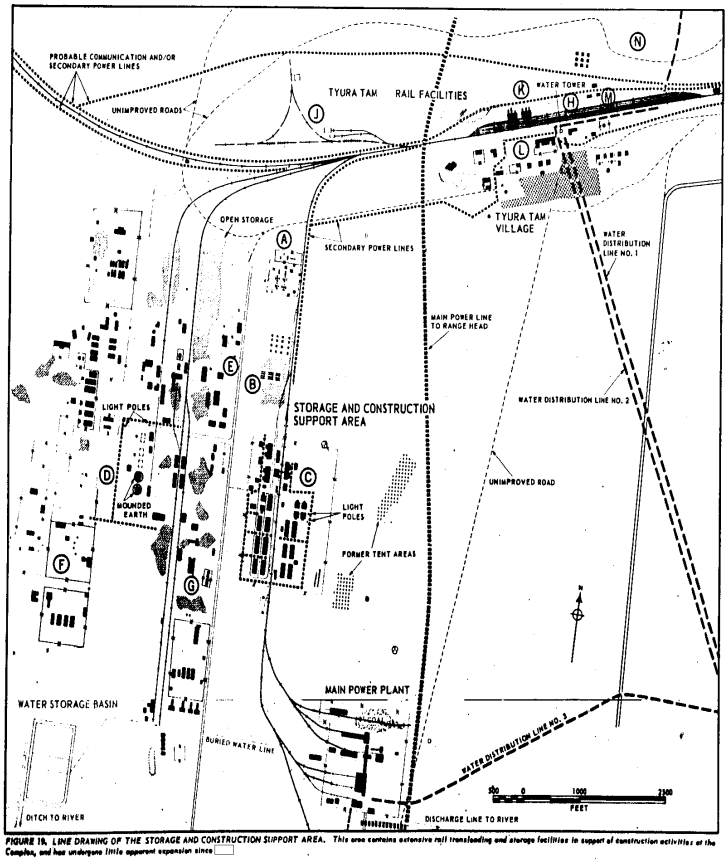

FIGURE 1b. LINE DRAWING OF THE STORAGE AND CONSTRUCTION SUPPORT AREA. This area contains extensive rail transloading and storage facilities in support of construction activities at the Complex, and has undergone little apparent expansion since [redacted]

25X1

Motor Pool (item F): The access lane which was located between the two areas has been eliminated and the areas now have a common fence separation. A fenced service lane separates the motor pool from two other fenced areas to the west and northwest. The section of access lane which lies north of the motor pool is 110 feet wide while the section to the west is 90 feet wide.

A newly fenced area southwest of the motor pool, encompassing approximately 17 acres, is being utilized as an additional motor park and also as a driver training area. There are now in excess of 150 vehicles present in these areas.

Large Shop-type Building (item G): The single-story shop sections, which parallel each side of the monitor portion of this building, have been extended 30 feet. The shop sections are now 195 feet long and the monitor roof section remains 165 feet long. The over-all width of the building remains 85 feet. This includes the two 20-foot-wide shops and the 45-foot-wide monitor which may define the approximate width of a traveling overhead crane. There is also a small building with a stack attached to the southeast corner of the building.

TYURA TAM RAIL FACILITIES

The classification yard (item H), two transloading buildings (item K), water tower, and the passenger station have remained unchanged since the previous aerial coverage. The two car repair shops, and the unidentified building to the northwest (item J) do not appear to be in use

and are probably being dismantled. The spur lines which served the car repair shops, and the turning "wye" appear to have been removed.

MAIN POWER PLANT

The thermal power plant which was under construction in [redacted] is now complete and in operation. A detailed description of this plant is included in the discussion of Fixed Power Production Facilities.

TYURA TAM VILLAGE AND ADJACENT FACILITIES

Several new, more modern type buildings of various sizes are scattered throughout the area. The possible crushing plant (item M), shows no change. The unidentified fenced area (item N), which was located 900 feet northeast of the possible crushing plant, has now been removed.

PROPELLANT PRODUCTION AND STORAGE AREA

The Propellant Production and Storage Area (Figure 20) located predominantly on the east side of the rail line has not been expanded but facilities under construction in [redacted] have been completed. A new rail-served facility is under construction to the west across the road and rail line and adjacent to the southern portion of the original area.

ADMINISTRATION AND STORAGE AREA

In the Administration and Storage Area (item A) the two buildings that were under construction in [redacted] have been completed. Two unidentified [redacted]-foot-diameter objects and the perimeter fence have been removed. Immediately to the east is a new building 40 by 20 feet and to the south is an unidentified object [redacted] in diameter which is positioned within a 35-foot circular earth emplacement. An athletic field has been added to the southwest of the area.

PROBABLE PROPELLANT OR HE STORAGE BUNKER

The Probable Propellant or High Explosive Storage Bunker (item B), the fence, and two associated small tanks are no longer there. However, a new building 55 by 35 feet has been constructed in approximately the same location.

WATER STORAGE TANK AREA "C"

See Water Treatment, Storage, and Distribution Facilities for a detailed description.

PROBABLE PROPELLANT PRODUCTION PLANT

The rail line under construction in [redacted] serving the Probable Propellant

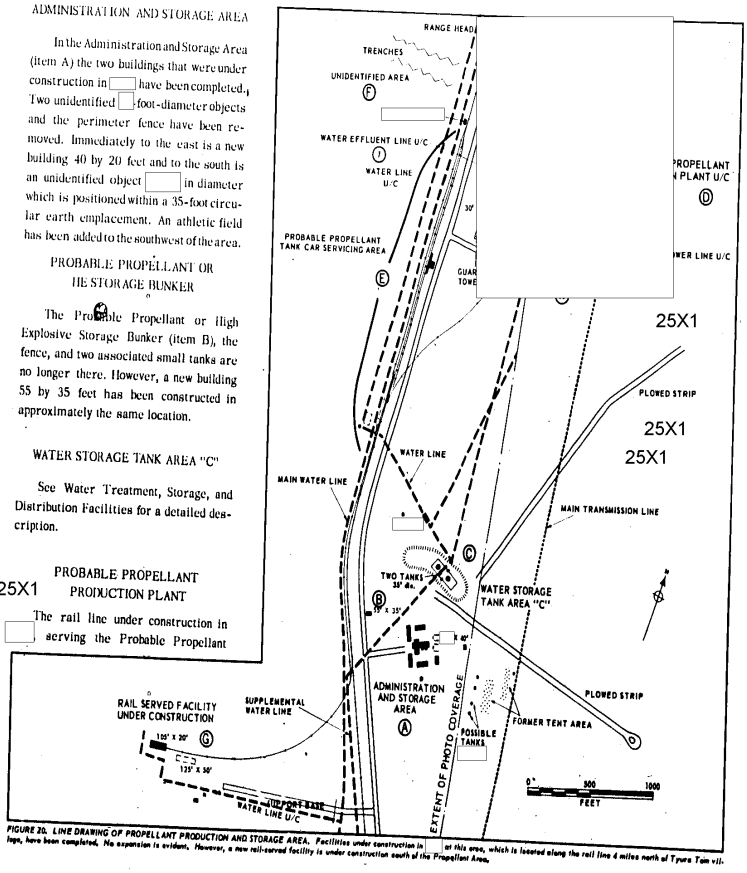

FIGURE 20. LINE DRAWING OF PROPELLANT PRODUCTION AND STORAGE AREA. Facilities under construction in [redacted] at this area, which is located along the rail line 4 miles north of Tyura Tam vil. have been completed. No expansion is evident. However, a new rail-served facility is under construction south of the Propellant Area.

Production Plant (item D), has been completed and its terminus expanded into three spurs. The entire production area has been enclosed by a fence or wall about 1,500 by 700 feet. The main production building is enclosed by a second fence or wall approximately 400 by 370 feet. Guard towers are located at the two corners of that portion of the large fenced area which is visible. Part of the area falls in the holiday. A new building 85 by 40 feet is located adjacent to the rail entrance to the large fenced area.

Possible Rail Transfer or Storage Building (item D-1): No change.

Main Production Building (item D-2): This building, which is neither completely covered by photography nor is it in stereo, appears to have undergone some modification to its west side. Two additions have been added, one near each end of the building. However, because of the lack of stereo it is undetermined whether these additions are shed-like structures or concrete loading docks leading to the rail spurs. One rail car about 35 feet long is standing near the northwest corner of the building.

Possible Propellant Storage Building Under Construction (item D-3): This building falls in the holiday.

Possible Generator Building (item D-4): This building falls in the holiday.

Storage Bunker (item D-5): The bunker falls in the holiday.

Unidentified Building Under Construction (item D-6): This building under construction on previous photography now appears complete although it is not entirely visible on the new photography.

Water Effluent Line Under Construction (item D-7): The water effluent line from the possible cooling tower is now completed and passes beneath the rail and road leading to Launch Area "A", and discharges shortly thereafter.

Possible Cooling Tower or Water Treatment Building (item D-8): No change.

Possible Administration and Security Buildings (items D-9 and D-10): Both buildings fall in the holiday. A new building 85 by 40 feet has been added at the rail entrance to the fenced area.

FUNCTION AND SIGNIFICANCE OF THE PROBABLE PROPELLANT PRODUCTION PLANT

The primary development of interest has been the terminating of the rail spurs in the plant area rather than passing through toward the Range Head as previously conjectured. However, no other developments are apparent which would change the original speculation that the plant may possibly fulfill the basic propellant requirements for the complex.

PROBABLE PROPELLANT TANK CAR SERVICING AREA (item E)

The rail-served building [redacted] feet by [redacted] feet has been removed. The rail line under construction to the Probable Propellant Production Plant has been completed.

UNIDENTIFIED AREA (item F)

The four or more small unidentified objects and the line of poles have been removed. The small sections of trenches still remain.

RAIL-SERVED FACILITY UNDER CONSTRUCTION

This new facility (item G) under construction is located approximately 4,000 feet south of the Probable Propellant Production Plant and 1,500 feet west of the rail line leading to the Range Head. This new area is served by an 1,800-foot rail spur, an improved road, and a water line under construction, and consists of a rail drive-in building 105 by 20 feet, a building under construction 125 by 50 feet, 2 small construction sheds, and building materials lying about the general area. Two rail cars are situated on the track in front of the rail drive-in building. This new area is provided direct access to the Probable Propellant Tank Car Servicing Area (item E) by a new 1,700-foot-long rail siding paralleling the main line. The location of this area suggests a function associated with the Propellant Production and Storage Area.

POWER PRODUCTION AND DISTRIBUTION FACILITIES

The main power plant at the Support Base and the steam/power plant located at Launch Support Area "A" are probably capable of supplying power to sustain operations of the Complex. The Aralsk/Tashkent grid and mobile power units would supply supplementary or emergency power as needed.

FIXED POWER PRODUCTION FACILITIES IN THE COMPLEX

Main Power Plant: The thermal power plant, previously under construction, is now complete and in operation (Figure 21). A 95-foot stack has been constructed just north of the boilerhouse. Three induced-draft ducts are apparent and indicate that there are probably three boilers. The over-all yard is solid fenced, essentially rectangularly-shaped, and measures 1,340 by 1,190 feet with an appendage 315 feet by 190 feet. Most of the ditches present in [redacted] are now covered. Most of the roads and railroad spurs have paralleling drainage ditches which are not indicated on Figure 21. The coal yard contains a single-track rail spur which has a gravity-type coal trestle approximately 300 feet long. This spur line extends 190 feet beyond the fence of the power plant yard. The 320 by 45 foot modified T-shaped building which was previously thought to be the coal yard is probably utilized as a thawing building during the winter months. It now contains a drive-in rail spur. An underground extension of the inclined conveyor connects with the building.

25X1

The two 25-foot-diameter tanks northeast of the coal tower have been buried and are serviced by a pumphouse 35 by 20 feet. Buried pipelines lead to the coal tower, to the 210 by 40 foot building west of the coal tower (erroneously shown as 90 feet wide in HTA/JR-4/58), and probably to the rail drive-in, T-shaped building.

The boilerhouse is now serviced by the completed water storage basin 4,400 feet west of the power building. The water storage basin is connected to the river 6,400 feet to the south, by a ditch. There are two transformers adjacent to and in between the control building and rail spur. There are 8 other new buildings of various sizes with unidentified functions, within the fenced enclosure.

Steam/Power Plant: No changes are noted to the steam/power plant in Launch Support Area "A".

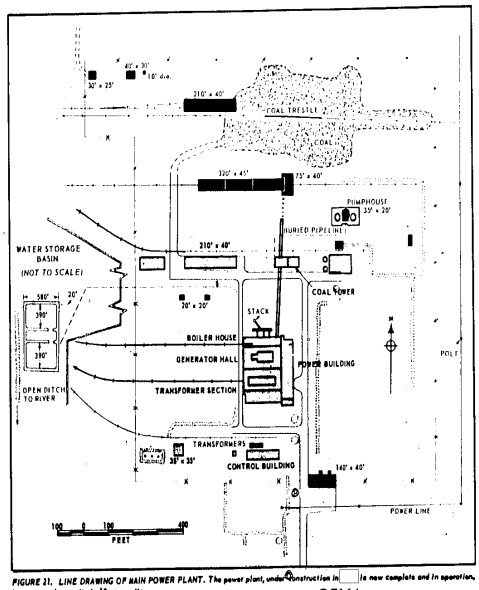

FIGURE 21. LINE DRAWING OF MAIN POWER PLANT. The power plant, under construction in [redacted] is now complete and in operation. Its estimated capacity is 10 megawatts.

25X1

POSSIBLE SUPPLEMENTARY SOURCES OF POWER

Aralsk/Tashkent Power Grid: No apparent change.

Mobile Power Units: No mobile power units are discernible but they are probably available for auxiliary and/or emergency use.

MAIN POWER TRANSMISSION LINES

Although photographic coverage is incomplete in the area of the Probable Propellant Production Plant, it is logical to assume that the line from the main power plant to the Range Head is now complete.

POWER SUBSTATION

The power substation, situated at the terminus of the main power transmission line to the Range Head, has been enclosed by a fence 155 feet square.

WATER TREATMENT, STORAGE, AND DISTRIBUTION FACILITIES

Complete information on the treatment, use, and distribution of water would be a prime factor in a conclusive operational analysis of the Launching Complex. The new coverage makes additional information available, and makes possible some reanalysis and reassociation of facilities. The complete water system (Figure 22) for the Complex now appears to consist of two water treatment facilities, a probable water purification plant, four water storage tank areas, and four major distribution lines.

WATER TREATMENT FACILITIES

Water Treatment Facility "A": This facility (Figure 23), operational in [redacted] and previously referred to in HTA/JR-4/58 as "Old Water Treatment Facility", is located on low land near the river. It remains unchanged except for the completion of a 40-foot-diameter, 30-foot-high water tank. Major distribution lines Nos. 1 and 2 lead from this facility and terminate at the village of Tyura Tam and Launch Area "A" respectively.

Water Treatment Facility "B": This facility (Figure 23), referred to in HTA/JR-4/58 as "New Water Treatment Facility" under construction, is located on the bluff overlooking the Syr Darya River. It was under construction in [redacted] and is still being developed. However, several of its features have been completed and it is at least partially operational. The facility is fenced and the six sedimentation basins, five containing water and one empty, are complete. A secondary treatment basin has been added and located between the sedimentation basins and the pumphouse. Also new are four buildings. One is a large multistory building under construction which may possibly be for the demineralization of water. The others are unidentified. Major distribution lines Nos. 3 and 4 lead from this facility and terminate at the main power plant and Launch Area "B" respectively.

Probable Water Purification Plant: No change has been noted in this small fenced plant (Figure 23) which was apparently operational in [redacted] It is believed to purify water for drinking purposes since a water line can be traced to the Administration and Housing Area.

25X1

25X1

WATER STORAGE FACILITIES

25X1

Water Storage Tank Area "A": This storage area (Figure 9), located at Launch Support Area "A", remains unchanged except that two [redacted]-diameter tanks, under construction in [redacted], are complete, earth covered, and included in the expanded fenced area. In addition to these two tanks, the area consists of two [redacted]-diameter tanks, two 45-foot-diameter tanks and a small building. The water line that was under construction between the newly covered tanks and Missile Checkout and Assembly Facility No. 2 is complete. Four other lines leave this Storage Area, three to Launch Area "A" and one to the vicinity of Missile Checkout and Assembly Facility No. 1.

Water Storage Tank Area "B": This storage area, under construction in [redacted] is complete. It is located near the point where the new rail line to Launch Area

25X1

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25X1

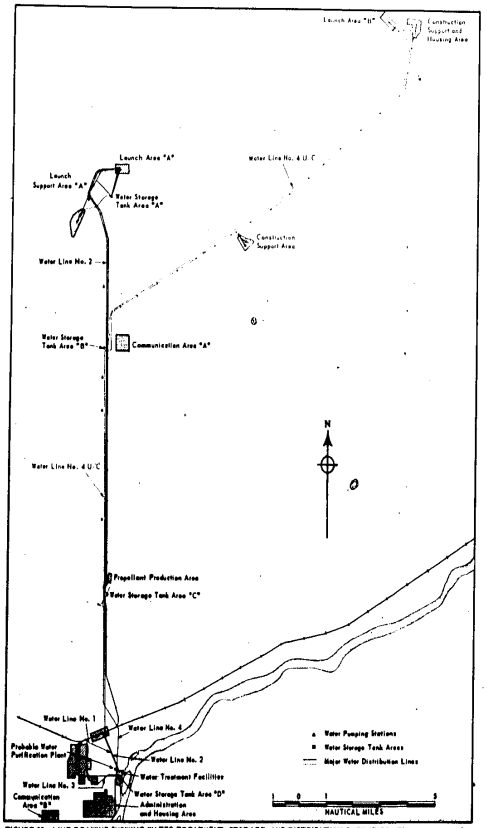


FIGURE 22. LINE DRAWING SHOWING WATER TREATMENT, STORAGE, AND DISTRIBUTION FACILITIES. The water system for the Complex consists of 2 water treatment facilities, a probable water purification plant, 4 water storage tank areas, and 4 major water distribution lines. The new portion of water distribution line No. 4 extends from Water Storage Tank Area "C" to serve new Launch Area "B".

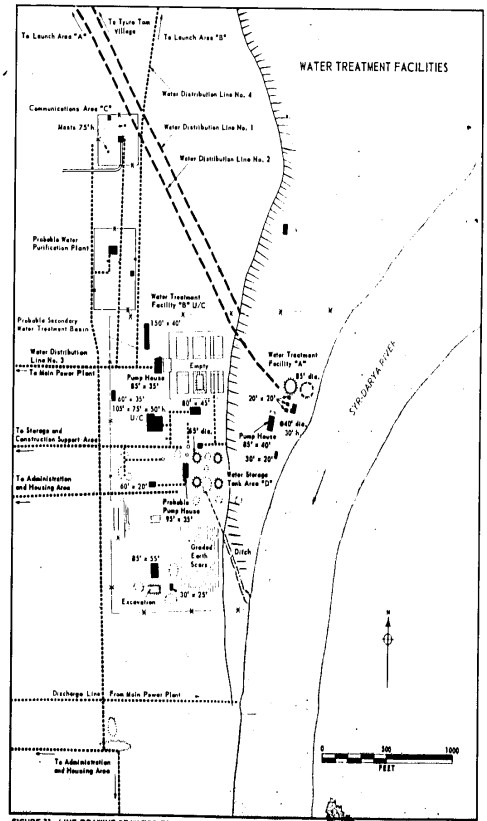


FIGURE 23. LINE DRAWING OF WATER TREATMENT FACILITIES. These facilities treat water from the Syr Darya River which is distributed throughout the Complex by means of major distribution lines. Water Treatment Facility "A", complete and operational in [redacted] supplies Distribution Lines Nos. 1 and 2, whereas Water Treatment Facility "B", partially operational in [redacted] supplies Distribution Lines Nos. 3 and 4.

25X1 25X1

"B" branches from the line serving Launch Area "A". It consists of two 55-foot-diameter tanks which have been earth covered, two possible semi-buried tanks which may have been covered since they are no longer visible, and a building. A fence 245 feet square encloses the area.

Water Storage Tank Area "C": This fenced storage tank area (Figure 20) now consists of two 35-foot-diameter tanks emplaced on top of a small hill and a pumphouse measuring [redacted] feet which is located 375 feet northwest of these tanks. The only changes noted are the removal of two small buildings and a [redacted] diameter tank near the pumphouse.

Water Storage Tank Area "D": This storage area (Figure 23), located inside the fence which encloses all of the water treatment facilities, consists of four 65-foot-diameter buried tanks, a pumphouse, and three newly constructed buildings. There is evidence of continuing construction work in the vicinity. The relationship of the storage area to the other water facilities cannot be determined. However, it may supply water to the Administration and Housing Area and to the Storage and Construction Support Area since two water lines appear to lead to these general areas.

WATER DISTRIBUTION FACILITIES
(Figure 22)

Water Distribution Line No. 1: Referred to as the "old water line" in HTA/JR-4/58, this line runs from Water Treatment Facility "A" to the village of Tyura Tam.

Water Distribution Line No. 2: Referred to as the "main water line" in HTA/JR-4/58, this line from Water Treatment Facility "A" parallels Line No. 1 as far as Tyura Tam village and then continues northward on the west side of the rail line to serve Launch Support Area "A" and Launch Area "A". Seven intermediate pumping stations are located at intervals varying from 1.5 to 3.5 miles along water distribution line No. 2. However, this line passes 130 feet in front of these small fenced pumping stations, and not through them.

Water Distribution Line No. 3: This water line was identified in HTA/JR-4/58 as part of a "supplemental water system". This line leads from Water Treatment Facility "B" to the Main Power Plant, 5,000 feet to the west, which is now operational.

Water Distribution Line No. 4: This water line, also previously identified as part of a "supplemental water system", leads northward from Water Treatment Facility "B" to Water Storage Tank Area "C" in the Propellant Production and Storage Area. From Water Storage Tank Area "C", two lines lead to the vicinity of the Propellant Plant and, in [redacted] a third line terminated on the west side of the main rail line. From this point the line is now being extended northward to Water Storage Tank Area "B", and from there northeastward to Launch Area "B". This line now serves Water Storage Tank Area "C" and the Propellant Production Plant. When fully completed it will also serve the new facility under construction at the Propellant Production and Storage Area, Water Storage Tank Area "B", the Construction Support Area, the Construction Support and Housing Area, and Launch Area "B".

Water Distribution Line No. 4 roughly parallels Line No. 2 for a distance of 10 miles. Four of the seven intermediate pumping stations are located along this distance. Line No. 4 passes just outside the fenced pumping stations while Line No. 2 passes 130 feet to the east of them. It is possible that these four pumping stations serve both lines. There is no evidence of any pumping stations along the portion of the line leading from Water Storage Tank Area "B" toward Launch Area "B".

COMMUNICATION FACILITIES

Three separate communication systems still appear to serve the complex. The largest and by far the most important is the radio communication system, which includes numerous facilities grouped in three separate areas. In addition, the Complex is served by a possible microwave relay communication system and by a wire communication system.

RADIO COMMUNICATION FACILITIES

Three installations, Communication Area "A", Communication Area "B", and Communication Area "C", still comprise the primary radio communication facilities serving the Complex. In total these installations contain 25 completed rhombic antenna arrays, 4 two-bay fishbone antenna arrays and at least 34 other masts. There is no evidence of continuing construction activity.

25X1
25X1 25X1

COMMUNICATION AREA "A"

Since the [redacted] photographic coverage, Communication Area "A" (Figure 24) has undergone some expansion with the addition of two new rhombic antennas (15 and 16), eight stick masts situated about the general area, three of which were on site but not erected in [redacted] and completion of ten rhombic antennas (5 through 14) that were under construction in [redacted] Another change has been the removal of rhombic antenna 1. The two new rhombic antennas, 15 and 16, are oriented on azimuths of [redacted] respectively, which compare favorably with the orientation of antennas 13 and 14 respectively. 25X1

Structures: No change.

[redacted]

25X1

25X1 [redacted]

- Antennas: The following changes have been made at Communication Area "A". Details of all rhombic arrays are given in Table 1.

1. Rhombic 1 has been removed.
2. Rhombics 5 through 14 have been completed.
3. Two new rhombics (15 and 16) have been constructed.
4. Four stick masts have been erected at Item 18.
5. One stick mast has been added to the linear array at Item 19.
6. Two stick masts have been erected, Item 21.
7. A stick mast has been erected adjacent to Building C.

COMMUNICATION AREA "B" 25X1

No changes have been noted in Communication Area "B" since [redacted] This area is the main receiving station serving the Complex, and contains 10 rhombic antennas, 4 fishbone antennas, and at least 3 linear arrays of poles. A line drawing of this area (Figure 25) is included to facilitate comparison of the receiving antennas at Area "B" with transmitting antennas located at Communication Area "A" (Figure 24).

COMMUNICATION AREA "C"

The 55-foot mast near the largest building in Communication Area "C" has been removed. No other changes are noted.

WIRE COMMUNICATION FACILITIES (LAND LINES)

No change.

POSSIBLE MICROWAVE RELAY COMMUNICATION FACILITIES

No change.

25X1

25X1

[redacted]

GUIDANCE AND INSTRUMENTATION FACILITIES

25X1

[redacted] photo coverage of the Tyura Tam Missile Test Range is limited to an area northwest and south of the Range Head. Because of this flight pattern the major instrumentation sites which indicated the probable primary direction of fire were not covered. No new or additional range instrumentation sites were apparent in the area covered. Therefore, the original opinions and conclusions regarding directions of fire from Tyura Tam cannot be amplified in this report.

GUIDANCE FACILITIES

25X1

No new evidence relating to the type of guidance system which the Soviets may be utilizing at the TTMTR has been revealed by the [redacted] photo coverage. Physical characteristics of collimation towers appear the same and the hypothesis drawn from their orientation has not changed. Instrumentation Sites 28 and 29 were not covered on the [redacted] photography. Consequently, no effort was made to elaborate on the theory that these sites are used as stations for a fixed radio guidance system. Installation of guidance facilities at Launch Area "B" had not been started in [redacted] 25X1

25X1

INSTRUMENTATION FACILITIES

The Instrumentation Control Center, the Interferometer-Type Instrumentation Site, and 11 other instrumentation sites now comprise the instrumentation facilities at Launch Area "A", 2 of the original 13 instrumentation sites having been abandoned. The 11 remaining sites will be discussed in detail under Range Head Instrumentation. With reference to the down range instrumentation sites, 4 were not covered, 14 have been re-evaluated as not being instrumentation, and 12 remain as such.

RANGE HEAD INSTRUMENTATION

The 13 instrumentation sites which are arranged around Launch Area "A" have been re-examined and two of these sites, 10 and 11, have been eliminated because of lack of ground activity and abandoned appearance of the structures or objects within the sites (Figure 26).

As for the remaining 11 instrumentation sites, their general location and ground scar activity rather than any specific objects, warrant the conclusion that these sites are associated with range head instrumentation. It should be noted that many of these 11 sites may be positions for mobile units. These mobile units probably consist of cameras, telescopes, radar and telemetry receivers. Changes to the instrumentation sites are noted below.

Site 1: Major Instrumentation Site. The only structure which can be identified within this site is the largest building, [redacted] feet. It cannot be determined whether the remaining objects and structures have been removed. The extent of

25X1

25X1

track activity remains approximately the same.

Site 2: Camera Stations Launch Area "A". No apparent change.

Site 3: Instrumentation Site. No apparent change.

Site 4: Instrumentation Site. No apparent change.

Site 5: Possible Instrumentation Site. Partial cloud cover precludes an accurate evaluation, but this site appears unchanged.

Site 6: Possible Mast with Counterpoise. Another radial ground pattern is located 130 feet southwest of the ground pattern identified in [redacted] No masts can be identified. 25X1

Site 7: Instrumentation Site. No apparent change.

Site 8: Instrumentation Site. Partial cloud cover prevents interpretation.

Site 9: Instrumentation Site. No apparent change.

Site 10: Previously active, this site has now been abandoned.

Site 11: Previously active, this site has now been abandoned.

Site 12: Instrumentation Site. Cloud shadow precludes analysis of this site.

Site 13: Possible Instrumentation Site. No apparent change.

INSTRUMENTATION CONTROL CENTER

The Instrumentation Control Center (Figure 27) has undergone considerable expansion since the [redacted] photographic coverage. The area has been increased from 4.5 to approximately 17 acres with the addition of at least 8 structures. This expansion has probably resulted from requirements that were levied by the satellite and space probe programs.

An important addition (item 19) in the new portion of the control center is a possible tracking antenna, 35 feet across.

25X1

Because of lack of stereo coverage, it cannot be determined whether this is a circular dish or a cut paraboloid. A scar, 20 feet long, [redacted] wide, and perpendicular to the center of the screen, may be either a ground scar or wave guide with a feed positioned at the end. If it is a circular dish, it may be a small radio telescope employed in the capacity of an elevation-azimuth antenna used for tracking.

If, however, this is a cut paraboloid, it still could be in the order of a radio telescope since the Soviets do employ a screen of this type. Another possibility is that this may be utilized as a high gain search radar.

A structure located to the rear of the antenna is probably the control bunker. No cables can be directly associated with the antenna. Other structures within this new area include three buildings (items 13, 14, and 15), two unidentified structures (items16 and 17), and two areas of unidentified activity (items 12 and 18). New items 12 through 19 are described below.

Item 12. Area of unidentified activity consisting of a concrete pad 35 feet square with a 15-foot-diameter cylindrical-like object located in the center; height unknown.

25X1

Item 13: Gable-roofed building 35 feet square.

Item 14: Gable-roofed building 105 by 55 feet.

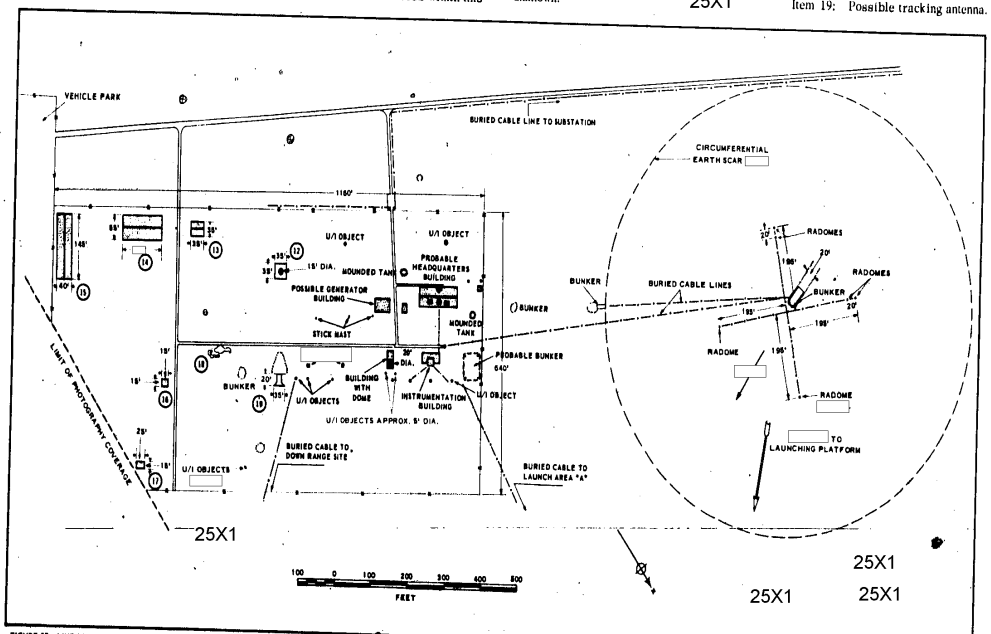
Item 15: Gable-roofed building 145 by 40 feet.

Item 16: Structure 15 feet square.

Item 17: Structure 25 by 15 feet.

Item 18: Area of unidentified activity.

Item 19: Possible tracking antenna.



25X1 25X1 25X1 25X1 25X1

FIGURE 37. LINE DRAWING OF INSTRUMENTATION CONTROL CENTER AND INTERFEROMETER-TYPE INSTRUMENTATION SITE. The instrumentation Control Center has been expanded to four times its original area. Included in this expansion are a large possible tracking antenna and at least three buildings.

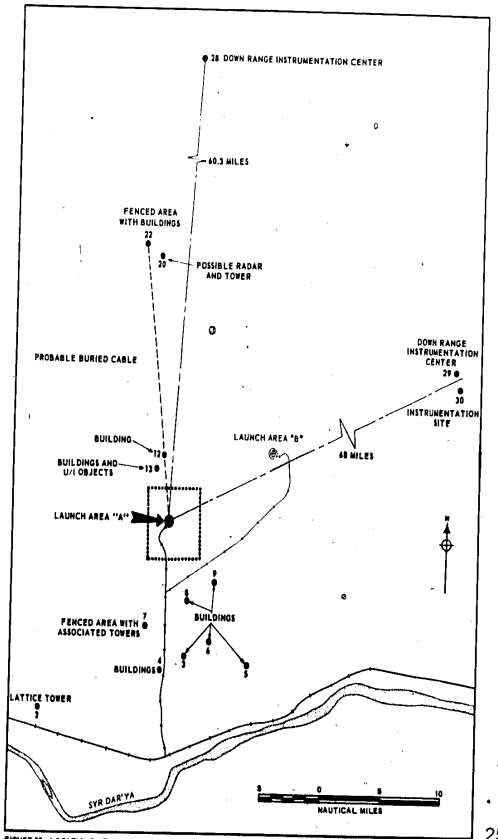


FIGURE 28. LOCATIONS OF DOWNRANGE INSTRUMENTATION. Only 16 of the 30 downrange sites reported in [redacted] are now identified as instrumentation sites. Three major downrange instrumentation sites (Nos. 28, 29, and 30) were not covered by [redacted] photography.

TABLE 2. COMPUTED LOCATIONS FOR DOWNRANGE INSTRUMENTATION SITES

SITE NO.	DISTANCE* N. MILES	DISTANCE* METERS	AZIMUTH* (DEG) (MIN)	LATITUDE (N) (DEG) (MIN)	LONGITUDE (E) (DEG) (MIN)
1	25.7			45 29	63 15
2	17.3			45 42	63 02
3	9.6			45 45	63 19
4	10.6			45 44	63 16
5	12.1			45 45	63 27
6	9.2			45 46	63 23
7	8.1			45 47	63 14
8	5.9			45 48	63 20
9	5.7			45 51	63 23
12	4.6			46 00	63 17
13	3.9			45 59	63 16
20	16.9			46 14	63 16
22	19.7			46 15	63 15
28	60.3			46 55	63 25
29	67.9			46 20	64 48
30	68.0			46 20	64 48

* DISTANCES AND AZIMUTHS ARE COMPUTED FROM LAUNCH AREA "A"

The old portion of the Control Center remains the same except for the removal of items 8 and 9.

INTERFEROMETER-TYPE INSTRUMENTATION SITE

The positon of the radar antennas at this Interferometer-Type Instrumentation Site have been remeasured and the new measurements are shown on Figure 27.

DOWN RANGE INSTRUMENTATION

Re-evaluation of the Down Range Instrumentation Sites (Figure 28), has resulted in deletion of many of the sites that were originally thought to be related to the TIMTR instrumentation net. Larger scale photography and better resolution, together with a certain lack of activity noted on comparative photography at many sites makes this re-evaluation possible. It is on the basis of these factors that 14 minor sites are deleted. These 14 sites are Nos. 10, 11, 14, 15, 16, 17, 18, 19 21, 23, 24, 25, 26, and 27. Of the remaining 16 down-range sites, Nos. 1, 28, 29, and 30 were not covered by new photography. On the limited coverage available on down-range instrumentation facilities, there are no indications that a major buildup or changes in instrumentation are being made.

• • •

CONCLUSIONS

25X1

Construction of a new launch area has been initiated since the [redacted] coverage. Although still in an early stage of construction in [redacted] it will probably be similar, if not identical, to the original launch facility. Completion of this new area will give the Complex another facility with a probable launch and test capability at least equal to Launch Area "A". 25X1

• • •

Construction of the new launch area does not appear to be proceeding on a "crash" basis.

• • •

The ground lay-out of certain water facilities which existed in [redacted] indicates that the new launch area was in the original plan for the Complex. 25X1

• • •

What was identified as a second launch area on the [redacted] photography has been reidentified as a support facility for Launch Area "A" and redesignated as Missile Checkout and Assembly Facility No. 2. 25X1

• • •

All firings from Tyura Tam prior to July [redacted] have been made from Launch Area "A". 25X1

• • •

25X1 The existence of four crater-like depressions 3 to 5 miles down range from Launch Area "A" may be indicative of missile malfunctions. One of these craters was present on the [redacted] photography, which if resulting from missile malfunctions, indicates firing activity prior to that time.

• • •

25X1 Considerable new detail of the launching structure has been derived from the [redacted] photography, which changes the concept of its structural design. However, detail is still not sufficient to clarify many operational aspects of the structure.

• • •

The nature of the darkened area in the center of the launching platform is undetermined. However, its regular circular shape indicates it is not a blast scar.

• • •

A separate and independent water system appears to exist for each launch area. It is possible that the intermediate pumping stations serve both lines, and that cross ties exist between the lines for emergency use.

• • •

25X1 The Probable Propellant Production Plant has been completed. Rail spurs now dead-end in the plant area instead of passing on through toward the Range Head as originally speculated. It was originally estimated that the plant would be in production by [redacted] photography shows little if any signs of activity in the area.

25X1

SOURCES

PHOTO DATA: 25X1

25X6

MAP DATA:

WAC 132, 246, Pilotage Charts 1220, 1416

REFERENCE:

CIA. HTA/JR-4/58, Missile Launching Complex and Test Range, Tyura Tam, USSR, Sep 58.

25X1

25X1